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COMPUTERWORLD

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Apple slices 18% off the cost of buying a Macintosh Plus. Page 33.

BASF yanks faulty cartridges plaguing IBM 3480 storage devices. Page 73.

LANs stunt minis' growth spurt

Mighty micros, tightened MIS budgets take toll on departmental systems

BY CLINTON WILDER
CW STAFF

Recent advances in microcomputer power and connectivity, combined with increasing MIS cost consciousness in an uncertain U.S. economy, are suddenly threatening to erode the minicomputer's pedestal in departmental computing.

MIS departments appear to be delaying purchases of minicomputers, which revolutionized corporate computing in the 1970s as an alternative to monolithic mainframes. However, corporations are forging ahead with the purchase of powerful microcomputers, such as IBM's Personal System/2 Models 60 and 80 and Compaq Computer Corp.'s Deskpro 386, to use as departmental file servers.

Last week, minicomputer leader Digital Equipment Corp. announced that earnings for its current quarter will fall below projections because order rates have been heavily skewed to its low-end systems, like the Microvax 3000.

"The days of the minicomputer as the premiere mid-range solution may be numbered," said Merrily Shinyeda, president of Tempe, Ariz.-based research firm The Sierra Group. "We believe that early LAN and file server installations are now perceived to provide at least equal performance in the minds of users . . . and to offer higher value for the dollar."

Growth stops here

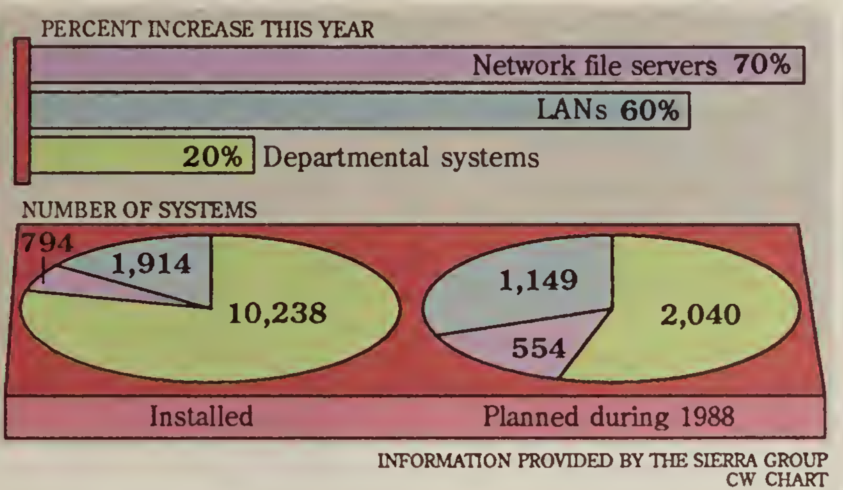
In a recent Sierra Group survey, 1,588 MIS executives and departmental managers said they plan to increase their installed base of departmental minis by 20% this year, compared with 60% more local-area networks and 70% more network file servers (see chart below). Only 16% of the sites surveyed said they plan to increase their budgets for departmental minis this year, compared with 40% one year earlier.

"The PC has made further gains as the platform of choice

Continued on page 8

Shifting preferences

Although traditional departmental minicomputers have been the systems of choice, a survey of 1,588 companies indicates that LANs and file servers are rapidly gaining parity



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CW CHART

Apple suit challenges Windows

BY ALAN J. RYAN
CW STAFF

CUPERTINO, Calif. — In a stunning repudiation of Microsoft Corp., Apple Computer, Inc. last week charged its top Macintosh software developer and Hewlett-Packard Co. with violating Apple's copyrighted user interface.

Analysts said Apple's lawsuit to protect its user-friendly audiovisual computer display could prove to be a serious blow to Microsoft's Presentation Manager, a critical element of Microsoft's MS OS/2 operating system.

The suit claims Microsoft's Windows Version 2.03 and HP's New Wave products infringe on its copyrighted interface.

The Presentation Manager, which will reportedly be based largely on Windows 2.0, is the graphical user interface portion of OS/2.

"Even a court case resolved in Microsoft's favor could hold up the introduction of the Pre-

Continued on page 128

IBM finally tosses lifeline to 8100 users

BY JEAN S. BOZMAN
CW STAFF

IBM last week made good on its promise to deliver a migration path for stranded IBM 8100 users by announcing a conversion aid to its 9370 machine and a revised version of the company's DPPX operating system, DPPX/370.

The conversion aid, which is scheduled to be available in December, changes the 8100's DPPX code into DPPX/370 code so that it can run on the 9370, IBM said. Since both operating systems were written in the same IBM programming language, the code is source compatible.

Although the move potentially affects 40% of the estimated 8,000 IBM 8100 information system users in the U.S., users show no signs of jumping to the 9370.

"There is a study under way here looking at the alternatives," said Michael McGeough, systems administrator for Mobil Oil Corp.'s 9370 project. Mobil has six 8100s: two in its Fairfax, Va., headquarters and four in a Valley Forge, Pa., data center.

"Before this, we didn't have

Continued on page 129

Inside

- IBM brings AIX to the 370 world and cuts off older 4381 models. Page 129.

NEWSPAPER

SECOND CLASS

OS/2 Extended in a fog

Users won't commit without details from IBM

BY ALAN J. RYAN
and ED SCANNELL
CW STAFF

MIS managers admit they will need the capabilities of IBM's forthcoming OS/2 Extended Edition but say their implementation plans have been stifled by a lack of specific technical information from IBM.

Contributing to the information drought is IBM's decision not to beta-test the product. "We have no plans for beta-testing, other than what we are doing in the development laboratories," Dave Harrington, IBM product manager of OS/2 Extended Edition, said last week. Harrington said IBM would rely on internal testing to validate the quality of the system.

Another factor delaying user commitment is uncertainty about applications whose benefits outweigh the significant hardware and software costs of implementing the multitasking operating system.

Of the dozen or so MIS managers interviewed last week by *Computerworld*, only one said he had seen a demonstration of the product from IBM. Those meeting with IBM to discuss the company's plans for OS/2 said they have been getting more marketing hype than useful technical information.

"Generally, the only exposure to OS/2 [Extended Edition] is superficial. So far, it has been mostly marketing rather than technical," said Rick Frye, manager of research and development at Carolina Freight Carriers Corp. in Cherryville, N.C.

IBM said it remains confident it can deliver OS/2 by the end of July, as promised last fall. The product is now in the middle of the systems testing process at

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Middle ground. Protecting its mid-range customers from the likes of IBM and DEC, Unisys rolls out the 2200/400 family of processors to extend performance of older Sperry line. Page 8.

Going down. AT&T unveils three models of its low-end 6300 Workgroup System, highlighting their ability to accommodate a variety of communications add-in boards. Options include an 8086 processor, floppy drive kits and an expansion board. Page 5.

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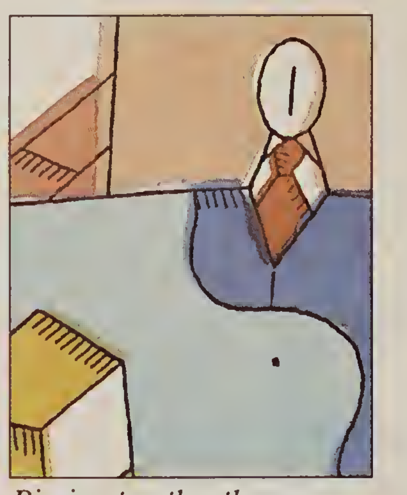

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Quotable

"We plan to be a $400 million to $500 million company in four or five years. There is also a chance we could be a zero-million-dollar company."

JOHN WILLIAM PODUSKA
STELLAR COMPUTER, INC.

See story page 14.

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ACM pioneer Berkeley dies

Remembered as conscience of the industry

BY JAMES CONNOLLY
CW STAFF

Edmund C. Berkeley, the man characterized as the conscience of the computer industry because of his efforts to make computers work for the good of mankind, died recently after a lengthy illness.

Berkeley, a mathematician, author, social activist and editor and publisher of *Computers & People* magazine, had been a noted figure in the computer industry since its early days. He died of cancer March 8 in a Boston hospital at age 78. Services are scheduled for Saturday in Newton, Mass.

A New York native and 1930 graduate of Harvard College, Berkeley worked at the Harvard Computation Laboratory with Howard Aiken on the design of circuits for the Aiken Mark II Relay Calculator and helped plan Prudential Life Insurance Company of America's acquisition of one of the first Univac computers.

Berkeley is credited as the driving force in the founding of the Association for Computing Machinery (ACM) in 1947, and he served as the first ACM secretary. A year later, he founded Berkeley Enterprises, Inc., which publishes *Computers & People* and the *Computer Directory and Buyers Guide.* Berkeley authored 16 books.

But even when he knew he had only months to live, Berkeley staunchly refused to discuss the accomplishments of his early years, preferring to talk about how computers can be used to help the world in the future, according to ACM executive James Adams, who interviewed Berkeley for a 1987 tribute.

"He was really a remarkable individual who had the insight to see what role computers could have in society," said Patrick J. McGovern, chairman of International Data Group, the parent company of CW Publishing, Inc. and *Computerworld.*

Judy Callahan, president of Berkeley Enterprises and a business associate for 15 years, commented, "I think his greatest contribution to the industry was to make the industry itself understandable to the nontechnical person. He always stressed that technology was not for technology's sake and research was not for the sake of research. There had to be a benefit for mankind."

Tandy laps up Grid, steps into corporate marketplace

BY JULIE PITTA
CW STAFF

FORT WORTH, Texas — Tandy Corp. last week reached an agreement to acquire Grid Systems Corp., a Fremont, Calif.-based manufacturer of laptop computers, for about $55 million in Tandy common stock.

Grid, which will maintain its headquarters and management team, will operate as a wholly owned Tandy subsidiary. Grid officials could not be reached for comment.

The purchase of Grid offers Tandy an entrance into new markets, according to Ed Juge, Tandy's director of product development. Grid, which exclusively employs a direct sales force, sells to both government agencies and Fortune 1,000 companies.

Projections call for Grid to reach $100 million in sales this year, Juge added. Tandy has mostly sold to home and small business markets through its Radio Shack retail stores.

The agreement also offers Tandy a U.S.-based product development team and production plant for laptops. Tandy's LT1400, introduced late last year, is produced by Far East suppliers, an arrangement that is expected to continue for now.

The pairing represents an odd couple because Tandy is known for its competitively priced IBM-compatible personal computers, and Grid is a manufacturer of high-performance laptops, said Peter Teige, an industry analyst for Dataquest, Inc.

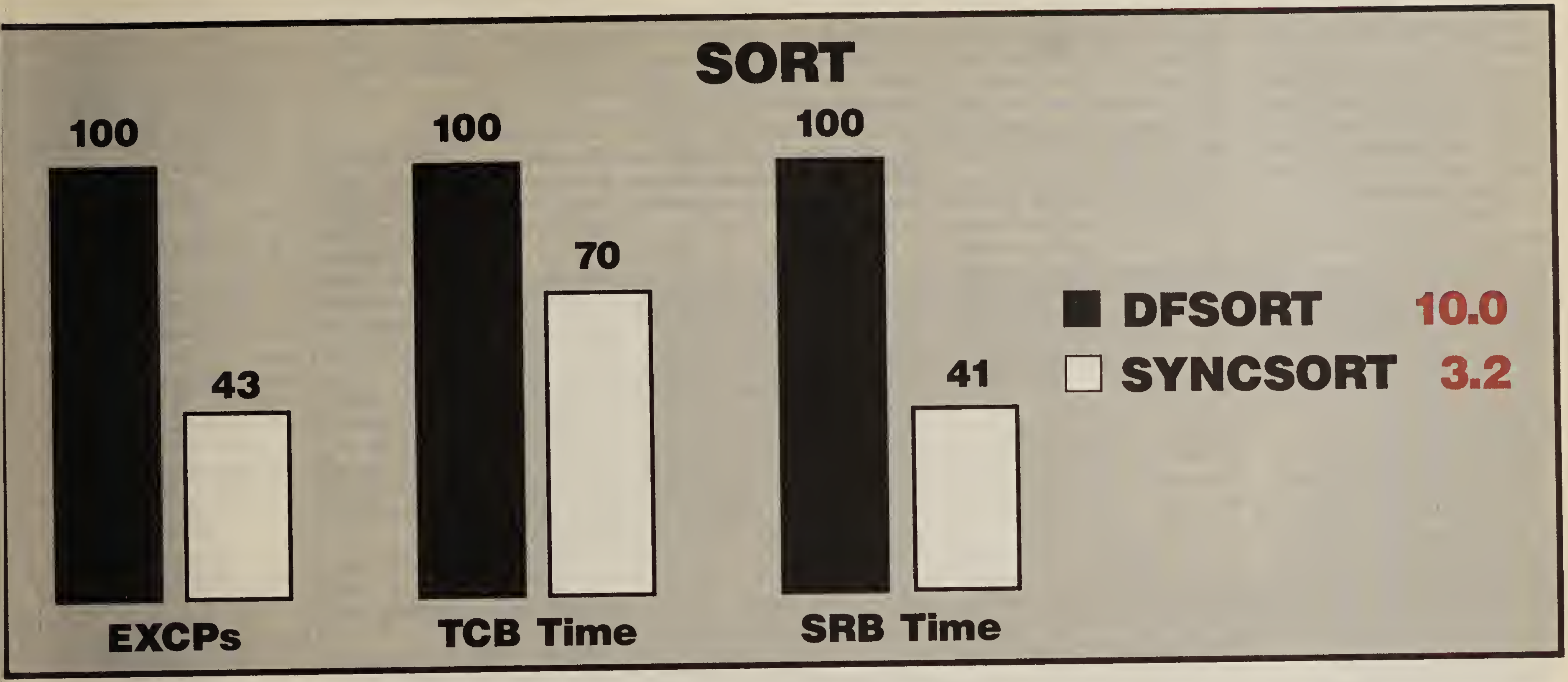
Vive la difference

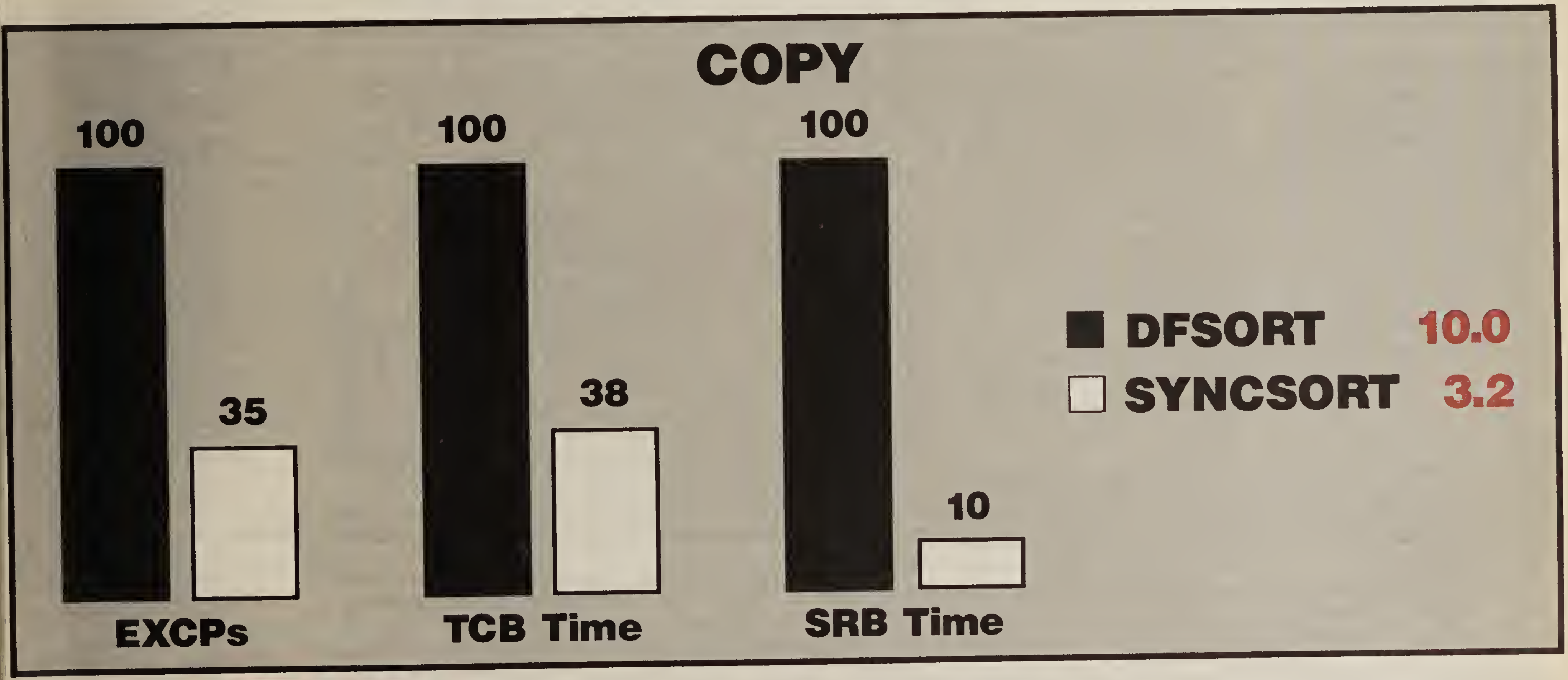
"But that's probably what makes it complementary — there's no overlap in what they do," Teige said. "Tandy is a large mass manufacturer and mass merchandiser," he continued. "Grid is low-volume, premium-priced and almost a custom manufacturer."

According to Dataquest, Grid had between 11% and 12% of the worldwide laptop market last year. About 500,000 laptops were shipped worldwide in 1987, Dataquest reported.

Teige said Grid faces stiff competition from larger domestic and Japanese laptop manufacturers and was likely strapped for cash. Tandy's high-volume purchase of microcomputer components may allow Grid to bring down the prices of its laptops, he added.

SYNCSORT 3.2
vs.
DFSORT 10.0





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Dbase SQL pact near

Ashton-Tate to link up with Interbase engine

BY STEPHEN JONES
CW STAFF

TORRANCE, Calif.— Seeking to placate an SQL-hungry public, Ashton-Tate Corp. is expected to build a Presentation Manager version of Dbase around a transaction-oriented SQL engine furnished by Interbase Software Corp., sources close to both companies said last week.

Through a joint development agreement to be announced next month, the SQL language from Interbase's mid-range relational data base management system will be reworked and embedded into the code for the new Dbase package, according to sources familiar with the partnership.

> TO MELD the two products together, developers will have to build hooks into the Dbase language and into the Interbase SQL engine designed to link the two.

Acting as a relational back-end engine through which data can be stored and retrieved, the Interbase component will be able to sit on a personal computer, network server or high-end workstation connected to minicomputers or mainframes.

An Interbase offical confirmed the pending agreement, but both Interbase and Ashton-Tate declined to comment officially.

To meld the two products together, sources familiar with both technologies said that developers will have to build hooks into the Dbase language and into the Interbase SQL engine designed to link the two.

Analysts were skeptical, however, whether Ashton-Tate could complete the shuffling of code to meet its self-imposed deadline of delivering a Presentation Manager version of Dbase within 90 days of the operating system's November release.

The combined product, known informally as Dbase V or Dbase PM, will be a critical one for Ashton-Tate. OS/2 Standard Edition 1.1 with the Presentation Manager is expected to become a major battleground in the emerging relational data base management system market, in which companies such as Lotus Development Corp. have said they will make their first run at Ashton-Tate.

If industry leader Ashton-Tate is to regain some of its lost glory, analysts said, a strong SQL implementation is crucial. "This will be another piece of the technology puzzle for Ashton-Tate — they're filling in some of the holes," said Bruce Johnston, an analyst with First Boston Corp. in New York.

Some observers said that Ashton-Tate had given up on the back-end data base server market earlier this year when it agreed to support Microsoft Corp. and Sybase, Inc.'s SQL Server. But with the Interbase SQL engine incorporated into Dbase V, Ashton-Tate could get back into the running for a share of the back-end market.

Competitive tension

Whether the Interbase SQL engine will be a challenge to SQL Server as an industry standard is not clear, but the new product could create some competitive tension in Ashton-Tate's relationship with Microsoft.

Adopting the Interbase technology could bootstrap Ashton-Tate into the distributed data base processing market across a variety of platforms.

Tyngsboro, Mass.-based Interbase has built a reputation on the strong networking capabilities of its relational data base management system, called Interbase.

The package provides distributed data base access and processing over networks on systems from Digital Equipment Corp., Apollo Computer, Inc. and Sun Microsystems, Inc.

Interbase's relational system is "a first-class data base management system that is particularly good for networks and distributed data processing," said Richard Finkelstein, a senior consultant with the Codd and Date Consulting Group in Chicago.

CORRECTIONS

Readers who want to place a vote in the CW Microcomputer Awards [CW, March 14] may submit a reasonable facsimile of the printed ballot. However, only one entry is allowed per person.

Benchmaster Release 1.2 [CW, Feb. 15] is a product of A&T Systems, Inc., 12501 Prosperity Drive, Silver Spring, Md. 20904. 301-384-1425.

Current users of Symantec Corp.'s Q&A Version 2.0 can upgrade to Version 3.0 [CW, March 7] for $69.95.

MIS's changing role cited as salary levels escalate

BY JAMES CONNOLLY
CW STAFF

CLEVELAND — Inflation and the rising value of systems personnel have driven MIS salaries soaring past income levels that were unheard of only three years ago, according to a study released last week by the Association for Systems Management (ASM).

ASM's survey of almost 2,400 members in the U.S. and Canada showed that median salary rose by 13.3% between 1984 and 1987. It also found that 23% of the MIS professionals earned more than $60,000, compared with none in a 1984 study.

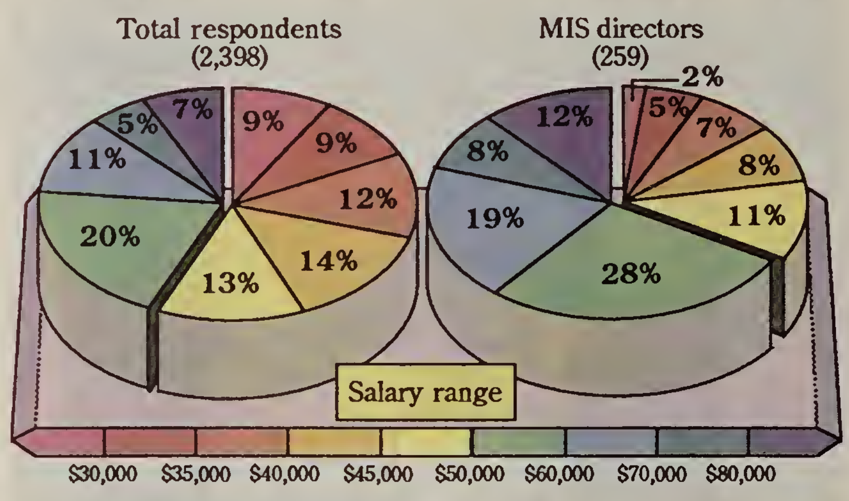
ASM officials cited inflation and the growing recognition of the systems professional as part of the business team as the forces behind the salary increases.

Casting the mold

The report also painted a picture of typical MIS personnel by matching salaries to job titles, responsibilities, experience, age and education.

Upward mobility

An Association for Systems Management survey indicates that 43% of ASM members earn $50,000 or more in annual salary and that 67% of members holding the title of MIS director earn in that range



INFORMATION PROVIDED BY THE ASSOCIATION FOR SYSTEMS MANAGEMENT
CW CHART

In addition, the study examined where systems groups fit within their parent organizations and the use of personal computers by MIS personnel. The ASM found that 84% of the respondents used PCs, with 48% using them daily.

The highest paid systems personnel participating in the survey were the 7% earning more than $80,000 in salary and bonuses.

The typical MIS professional participating in the survey made between $50,000 and $59,000 (20% of the respondents), worked in a manufacturing type of company (34%) in the Midwest (35%). That typical worker had more than 20 years of systems experience (35%), had worked for only one company (25%), was between the ages of 40 and 49 (38%) and has an undergraduate college degree (36%) or a master's degree (28%).

What's in a title?

The most common job titles in the survey were manager (30%), senior analyst (12%), consultant (11%) and MIS director (11%). Most of the 173 respondents earning more than $80,000 were executive officers, of which there were 66; MIS directors, numbering 31; and managers or directors, numbering 30.

The ASM noted that supervising large MIS staffs tended to mean higher salaries for the supervisor, with more than half of those respondents in charge of 50 or more people and earning more than $70,000.

However, some ASM members (49) earned more than $80,000 while supervising fewer than five workers.

While the ASM found that salaries are rising for MIS professionals, the survey also showed the number of people receiving benefits in addition to salary to be on the decline in most categories, with the exception of cash bonuses.

ASM officials said salary growth is in part a result of systems groups taking on more important roles in the business organization.

The ASM warned, however, that future salary growth and increases in power for systems personnel are dependent on those MIS people developing new management skills and techniques. It said that growth is also dependent on MIS personnel moving from technology-driven operations to solution-driven operations through strong relationships with end users and senior management.

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Twisted-pair Ethernet gains favor

BY JAMES DALY
CW STAFF

SAN DIEGO — A six-month stalemate in the development of a standard for 10M-bit unshielded twisted-pair Ethernet 802.3 local-area networks ended late last week when an Institute of Electrical and Electronics Engineers (IEEE) study group recommended a plan developed by Synoptics Communications, Hewlett-Packard Co. and Wang Laboratories, Inc.

In the approved star-wired setup, twisted-pair transceivers are linked to a wiring hub. The wire then runs to another transceiver, which connects to an Attachment Unit Interface (AUI) — a standard, widely installed interface that can be used to connect a personal computer to either a twisted-pair or coaxial cable-based Ethernet. This interface provides users with an easier migration path between existing coaxial networks and the twisted-pair version.

The move by the IEEE's 10BaseT Study Group followed the withdrawal of the last remaining alternative, a proposal submitted jointly by 3Com Corp. and Digital Equipment Corp.

The chosen link

The study group agreed to focus its efforts on a standard optimized for twisted-pair, whereas the 3Com/DEC proposal focused on linking the installed base of coaxial cable-based Ethernets to twisted-pair hubs.

The 3Com/DEC model would have added a thin coaxial cable link to the twisted-pair connection, which could then support up to 25 workstations in a daisy-chain configuration.

The IEEE study group concluded that the 3Com/DEC model was built on the existing 10Base2 Ethernet standard and, hence, was inadequate. "This group should focus its efforts on a standard optimized for direct connection to twisted-pair," the group said in a statement.

Thought it was new

"The direct AUI attachment approach uses one twisted-pair to transmit and another to receive. It's a different signaling scheme and a different technology, and the group, therefore, felt they had a new standard," said Andy Verhalen, director of marketing for the hardware products division of 3Com.

An earlier joint proposal by Chipcom Corp. and Lannet Co. was withdrawn last month, and another plan by David Systems, Inc. was pulled last week.

The AUI plan has been endorsed by a bevy of companies that includes AT&T, Ungermann-Bass, Inc. and Western Digital Co. since its introduction last September.

The recommendation approved by the IEEE 802.3 Standards Committee Plenary Group has been forwarded to a task force that will begin nailing down specifications for a standard next month. Finalizing the specification should take six to nine months.

AT&T bumps up 6300 series with powerful chip

BY ED SCANNELL
CW STAFF

MORRISTOWN, N.J. — AT&T last week unwrapped a low-end version of its 6300 Workgroup System specifically designed to accommodate a variety of communications add-in boards.

Priced between $1,411 and $2,091, depending on the disk drive configuration chosen, the system has seven expansion slots to hold a combination of networking and memory boards. Users should be able to easily connect the system to the higher end versions of the Workgroup System family, according to Richard McGinn, vice-president of management at AT&T's Data Systems Group.

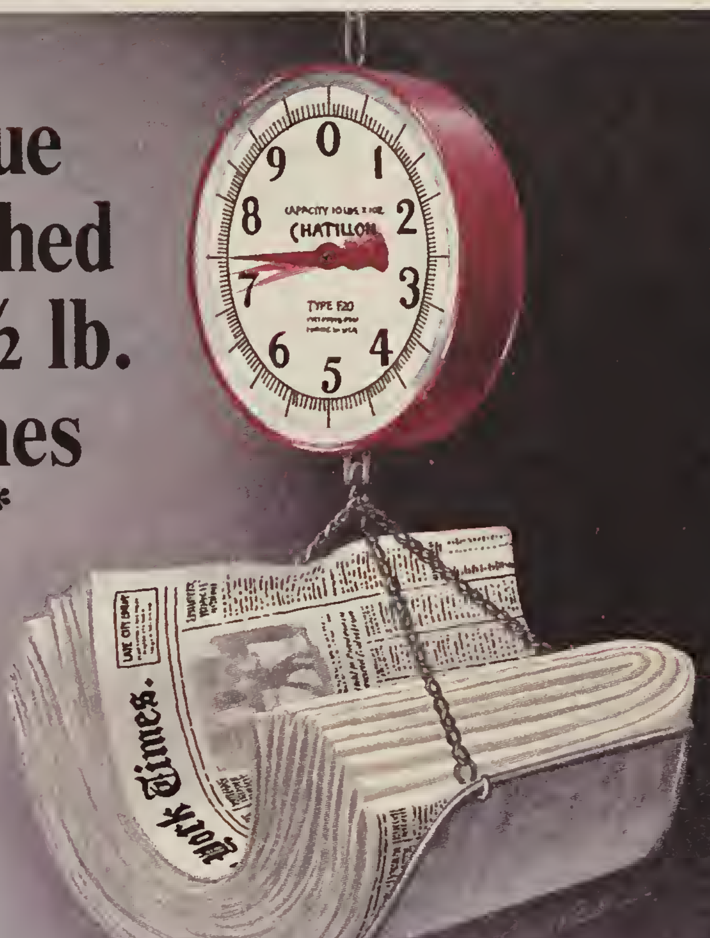
The Model 81, priced at $1,411, has a single floppy drive; the Model 82 contains two floppy drives and costs $1,491; and the Model 83 is a 20M-byte system that costs $2,091.

Choose your weapons

All three systems have a 10-MHz Intel Corp. 8086 processor and a 101-key AT&T keyboard and can be hooked up to any industry-standard monochrome or color monitor. They are compatible with IBM's Color Graphics Adapter, Enhanced Graphics Adapter and Video Graphics Array boards, an AT&T spokesman said.

Options for all three systems include an Intel 8087 math coprocessor, a 3½-in., 1.44M-byte Floppy Drive Unit Kit that permits 3½-in. disks to be used, a 5¼-in, 1.2M-byte floppy drive kit that allows 5¼-in. disks to be used, 40M- and 60M-byte streaming tape units, an AT&T mouse and an expansion board that allows the systems to serve as a facsimile machine.

All three systems are available immediately, AT&T said.



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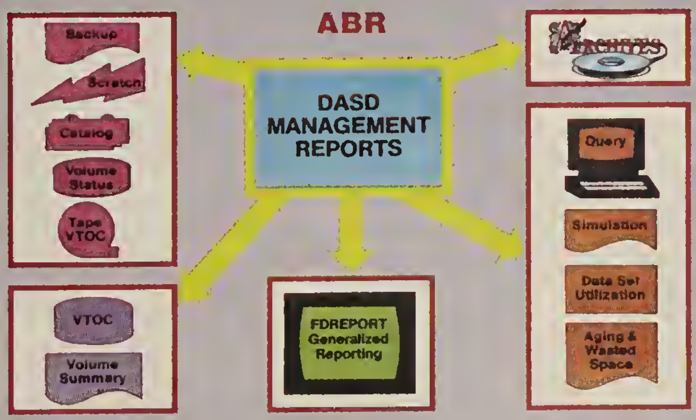

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Microsoft's LAN product to reach out

BY KATHY CHIN LEONG
and PATRICIA KEEFE
CW STAFF

Microsoft Corp. is expected to announce three OEM pacts next week designed to provide its LAN Manager with support for three major communications standards: Open Systems Interconnect (OSI), Transmission Control Protocol/Internet Protocol (TCP/IP) and IBM's Systems Network Architecture (SNA).

The OEM agreements, along with one between 3Com Corp. and Retix, will be detailed in San Francisco at the Microsoft Advanced Network Developers Conference, slated for March 30 to April 1.

3Com is expected to announce an OEM pact with Retix that is intended to provide OSI support for the latest release of 3Com's network operating system, the LAN Manager-based 3+Open.

Affects future products

Sources within 3Com said the relationship with Retix will extend to future 3Com OSI-related products. 3Com will make several announcements at the conference, a 3Com executive confirmed.

Reportedly, Retix will also provide OSI capabilities for the LAN Manager. Microsoft will unveil a similar, much-delayed OEM pact with San Jose, Calif.-based Excelan, Inc., a leading voice in the TCP/IP market.

The Microsoft-Excelan arrangement was mentioned in passing in a speech last week by Excelan President Richard Moore.

Another Excelan official said he expects that Microsoft will use the TCP/IP software as an option to enhance the LAN Manager.

Provides a link

A third pact with Orion Network Systems, Inc. in Berkley, Calif., will link IBM and Microsoft OS/2-based networks to SNA.

Orion said its server-based software will put IBM's Advanced Program-to-Program Communications interface on top of the Named Pipes feature of the LAN Manager, enabling users to access necessary resources off the network.

A Microsoft spokesman declined to comment on the agreements, but did say, "We believe there are three important protocols in the networking industry: IBM's Netbeui network protocol, TCP/IP and OSI."

OSI sights on distributed data

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Open Systems Interconnect (OSI) standards committee, celebrating its 10th anniversary, concluded a historic series of meetings last week that set the agenda for the next decade of work on interoperability standards.

The agenda for the OSI's "second era" is to develop a standards model for distributed data bases and to enhance the existing seven-layer OSI model, according to Richard des Jardins, chairman of Subcommittee 21 of the International Standards Organization. The subcommittee is in charge of information retrieval, transfer and management for OSI.

"By the end of the second 10 years, we should have a world information society," characterized by full interoperability of computer systems, des Jardins said.

The meetings in the U.S. capital, which lasted 2½ weeks, drew 400 delegates from 22 countries, including 100 U.S. delegates accredited by the American National Standards Institute.

Building a model

Progress was reported in several OSI projects, but the most dramatic initiative was the creation of a working group to develop a reference model of open distributed processing to ensure that computer users can gain transparent access to data bases stored on various dispersed systems.

Joost van Griethuysen, convener of the new working group, said the model should be completed in about four years but that a draft proposal will be available at the end of 1989. He said the model will be coordinated with OSI and data base management standards.

According to des Jardins, enhancements to the basic OSI model will come in the following three areas:

- Security, including passwords, transport encryption, access controls and authentication. The OSI Security Architecture was completed last week, but the architecture must be applied to each of the seven OSI layers.
- Network management framework. This helps network managers monitor the performance, resources and configuration of the system, according to Harold C. Folts, president of Omnicom, Inc., a Vienna, Va.-based OSI consulting firm.
- Support for Integrated Services Digital Network (ISDN). Therry Zylberberg, convener of the working group on OSI architecture, said he expects to see the convergence of OSI and ISDN standards by 1996.

Des Jardins cited several major accomplishments in the first decade of OSI work, including the seven-layer model in 1984; the approval of two applications for the seventh layer, FTAM and the CCITT X.400 electronic messaging standard; and wide industry acceptance of three OSI subsets, Manufacturing Automation Protocol, Technical and Office Protocol and the U.S. Government OSI Profile.

Proposal for No. 3

The subcommittee last week issued a draft proposal for a third OSI application, OSI-Transaction Processing (OSI-TP). Although the proposed application resembles IBM's Systems Network Architecture (SNA) LU6.2 protocol, the subcommittee stressed that OSI-TP has more technically advanced features than LU6.2 or any other proprietary networking architecture.

"OSI-TP is not the same as SNA's LU6.2," said Robin John, convener of the working group on application layer protocols.

There have been reports that IBM tried to force the standards body to adopt LU6.2, but OSI consultant Folts said, "they did not adopt straight LU6.2 by any means. They took a much broader and more advanced approach to satisfy a bigger range of needs."

HP net management promotes open windows

BY ELISABETH HORWITT
CW STAFF

CUPERTINO, Calif. — Hewlett-Packard Co. further muddied the network management standard waters last week by introducing its own version of an "open" network management system that is slated for eventual migration to the Open Systems Interconnect (OSI) standard.

The computer vendor's current customers are the immediate targets of the new Openview system, which provides centralized management of a wide range of HP wide-area and local-area networking devices through a graphics-oriented, windows-based IBM Personal Computer-compatible workstation.

But HP is also proposing Openview Windows — the user and software interface at the core of the new system — as an industry standard that would complement OSI network management protocols now under development.

'Common look and feel'

While the International Standards Organization is concentrating on defining OSI services and protocols for formatting, sending and collecting network management information, HP's Openview will provide users with "a common look and feel for managing different devices, as well as a common application interface," said Bernard Guidon, marketing director for HP's information networks group.

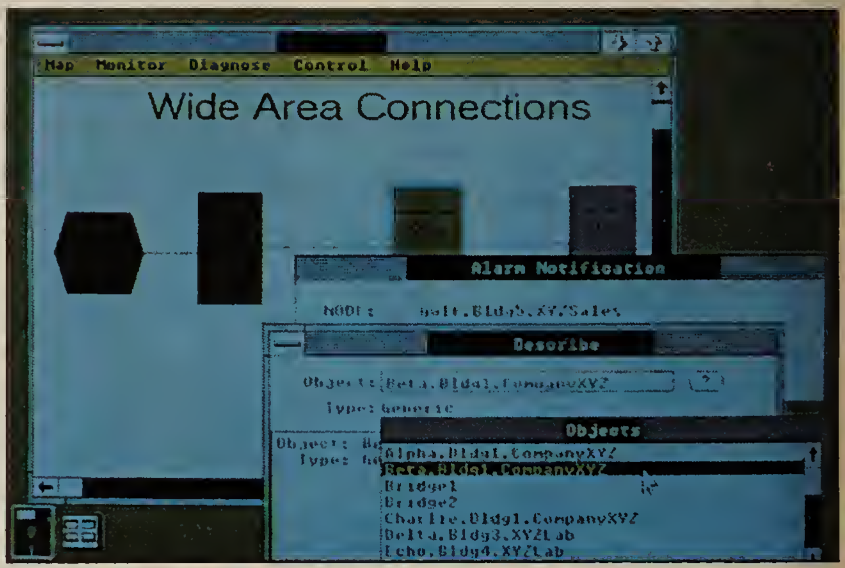
While Guidon emphasized that Openview would be linked to IBM's Netview, HP's proposal is likely to compete with Netview for industry-standard status. IBM has made it clear that it is working on its own user and application interfaces, based on its Systems Application Architecture (SAA).

Possibly hoping to defuse Openview's image as a Netview competitor, HP has revealed plans to migrate the system to the Presentation Manager, a component of Microsoft Corp.'s MS OS/2 that IBM has used as the basis for the common user interface within SAA.

Openview is also likely to butt heads with AT&T's Unified Network Management Architecture (UNMA). While the system was designed to manage AT&T network devices, AT&T is trying to get various UNMA elements — including a multiwindow user workstation — adopted as part of the OSI standard.

Closes hole

Right now, however, Openview fills a network management gap that neither OSI nor Netview has addressed by offering users "a standard set of symbols, icons and colors, so that when you look at the screen, it is graphically evident to you what is going on the network," said David Terrie, president of Newport Consulting in Scituate, Mass.



HP's Openview *gives users a common interface*

A future higher end version of the system will "use the PC as a window" into a Unix-based data base engine that will collect network management statistics for later retrieval and analysis, Terrie said.

The HP product allows the operator to simultaneously view different parts of the network in different windows; monitor a map of the entire network; and zoom in on a specific network device or segment to pinpoint a trouble area, Guidon said. An HP Vectra PC-based Openview Windows version is available now and is priced at $6,000 to $8,000, hardware included.

For wide-area network management, HP also introduced four new HP Openview software packages last week that run on an HP 3000:

- Openview Status and Diagnostic Monitor checks the status of remote HP 3000 computers and performs network- and protocol-level diagnostics. The product is priced at $6,000.
- Openview Performance Monitor collects network performance information that can be used to optimize communications traffic. It is priced at $6,000.
- Openview Network Command Interpreter, used with existing HP OPT/3000 software, is said to allow a manager to execute commands and programs and monitor use on remote HP systems. It is bundled with HP Network Services/3000 software at no extra charge.
- Openview In-Service Transmission Impairments Measurement Set Manager analyzes and isolates faults and quality degradation on telecommunications lines and devices. Pricing ranges from $1,000 to $2,000.

A fifth introduction, Openview Bridge Manager, monitors and troubleshoots HP network bridges from an Openview Windows workstation. It is priced at less than $2,500. All five of the above are scheduled to be available by year's end.

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Unisys pumps up 2200 series

Injects MIPS into 'mid-frame' line with one- to six-CPU machines

BY ALAN ALPER
CW STAFF

NEW YORK — Reaffirming a commitment to its Sperry mainframe customer base, Unisys Corp. last week showcased a series of Model 2200 mid-range processors that will significantly extend the performance of the product line when the machines begin rolling out later this year.

The six new models of the 1100/2200 series, called the 2200/400 series, range from an entry-level uniprocessor rated at roughly 2.4 million instructions per second (MIPS) to a configuration of six tightly coupled processors said to operate at about 14 MIPS, according to Neal Waddington, Unisys's vice-president and program general manager for mainframe systems.

Low-end models should be available in November, but the most powerful models are not set to be shipped until the third quarter of next year.

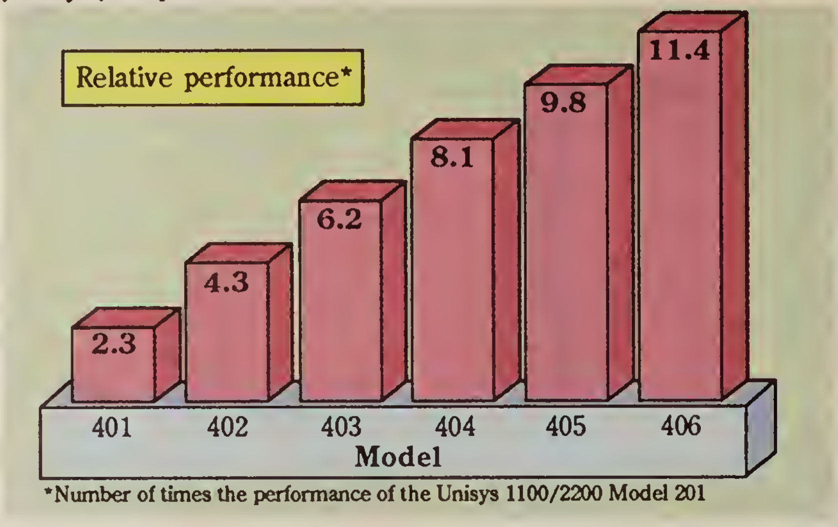
The 2200/400 family offers two to 11 times the performance of the 2200/200, the entry-level processor in Unisys's so-called "mid-frame" line, which was unveiled in late 1986. Installations of the 2200/200 family, which was reduced in price by 20% last week, are estimated by Waddington to be in the hundreds.

Guarding flanks

Aimed primarily at departmental and distributed processing environments, the 2200/400 line is positioned to protect the mid-range of the former Sperry Corp. installed mainframe base from incursions by other vendors, such as IBM and Digital Equipment Corp., analysts said.

Upgraded options

Unisys fills in its mid-range lineup with the upgradable 2200/400 family of six processors



*Number of times the performance of the Unisys 1100/2200 Model 201

INFORMATION PROVIDED BY UNISYS CORP.
CW CHART

The machines, which support a broad array of networking standards — including IBM's Systems Network Architecture — are also expected to provide Unisys with a way to more effectively compete with IBM's 9370 and 4381 and a broad range of DEC VAXs for new accounts requiring dispersed processing, the analysts added.

Base configurations of the six-member family are priced between $177,951 and $952,065, not including mass storage or an operating system.

Very large-scale integration semiconductor technology enabled Unisys to reduce the parts count on the new systems by about 90%, resulting in processors that offer four times the performance, require 70% less space, power and cooling and are less expensive to manufacture and maintain than the 1100 Models 60 and 70 that they effectively replace.

"This product, coupled with the NCR announcement (see story page 10), shows that the old mainframe guys are finally bringing to market competitively priced mid-range products," said Michael Geran, an analyst with The Nikko Securities Company International, Inc. in New York. "Unisys wants to protect its installed base, and they're leveraging new technology to compete from a price/performance perspective with DEC."

All 1100/220 applications will operate on the 2200/400s because the new series, like its predecessor, runs the old Sperry OS 1100 proprietary operating system. As part of Unisys's commitment to open systems, however, the 2200/400 will also run Unix as a guest operating system under OS 1100.

At a New York press conference held to unveil the processors, Unisys Chairman W. Michael Blumenthal said the 2200/400 series is evidence that Unisys is delivering on promises, made at the time of the merger between Burroughs Corp. and Sperry, to preserve Sperry customers' investments in mainframes.

"We said we'd maintain the two mainframe architectures of [Sperry and Burroughs], and we are accelerating the upgrading of the Sperry side to a state-of-the-art system," Blumenthal said.

The long haul

James Ault, president of Use, Inc. — a Sperry users group — and director of information services at Creighton University, said the series indicates that the 1100/2200 architecture will be maintained by Unisys for some time to come. "The important thing is, you don't have to do conversions or rewrites to move applications onto this system," Ault noted.

The single- and dual-processor configurations, called the Models 401 and 402, will be available in November; the three- and four-processor machines, the Models 403 and 404, should be shipped in the second quarter of 1989; and the five- and six-processor units, the Models 405 and 406, will be delivered in the third quarter of 1989, the company said. None of the systems have entered beta testing yet, according to Unisys's Waddington.

The Model 401 consists of one instruction processor, one I/O processor, 16M bytes of main memory, an I/O accessory cabinet, a shared I/O processor supporting low-speed communications, a console and maintenance facilities. The initial configuration can be ugraded with a maximum of five instruction processors and nine I/O processors.

Up to 64M bytes of main memory is supported on the Model 401, and up to 64 I/O channels can be connected to any 2200/400, compared with a maximum of 56 on the 1100/70, Unisys said.

Minis

FROM PAGE 1

for software in most applications categories," Shinyeda said. "More managers have reported plans to purchase LAN-based word processing and imaging software this year."

The corporate spending trend away from minis appears to be exacerbated by uncertainty about the U.S. economy. Although both big-ticket mainframes and lower cost micros appear to be holding their own, the minicomputer is the prime candidate for delayed purchase if a company wants to put the brakes on its MIS spending.

"The lead cycle on a mainframe is longer," said analyst George Elling of Merrill Lynch Research. "If you made plans before this quarter to purchase a mainframe, you'll go ahead with them. With a mini or supermini, there's a tendency to make sure your own business is healthy before you go ahead. With PCs and workstations, companies don't have the fear about spending that kind of money."

First to go

Elling's observation is supported by the recently formed 50-member Sierra Group/First Boston Corp. MIS Executive Council. A majority of that group said departmental minicomputer budgets would be cut the most in a recessionary economy.

Mark Steinkrauss, DEC's director of investor relations, said DEC sales representatives have seen "an unmistakable drift to the low end" in booking orders for the quarter ending March 31. "For higher dollar items, the closure time was longer than they expected," he said. "But the demand for workstations, servers and terminals has been much higher than we anticipated."

> "THE ONLY [mini] company that still looks strong is HP."
>
> GEORGE ELLING
> MERRILL LYNCH RESEARCH

Although Steinkrauss said DEC believes the recent introduction of its high-end Polar Star and renewed economic confidence can reverse that trend, investors are not so sure. The stock prices of DEC, Wang Laboratories, Inc., NCR Corp., Prime Computer, Inc. and Data General Corp. have fallen in the past two weeks in a rising market as analysts have turned bearish on the mini business.

"The only [mini] company that still looks strong is Hewlett-Packard Co., because of a new product cycle," Elling said.

The disappointing sales of IBM's 9370, the ballyhooed departmental system, provide further evidence of the trend. Although the 9370 results can be attributed to a variety of factors, at least one early 9370 customer, United Airlines' Covia Corp. subsidiary, scaled back its purchase plans when it was able to run many of its travel agency software modules on PS/2 Models 60 and 80 [CW, Jan. 18].

"The idea of downsizing doesn't just apply to the mainframe; minis are being downsized also," said David Wu of S. G. Warburg & Co. "More and more applications on minis will be done on workstations and networked PCs. The minicomputer business is now a mature business and won't grow very fast."

Netlink spins SNA Hub into Token-Ring

BY ELISABETH HORWITT
CW STAFF

RALEIGH, N.C. — Netlink, Inc. has turned its SNA Hub into a gateway that the firm said supports up to 200 concurrent IBM 3270 or LU6.2 sessions between an IBM Token-Ring network and multiple hosts.

The gateway gives Token-Ring users access to all the capabilities of Netlink's SNA Hub communications processor, including the ability to run concurrent 3270, LU6.2 or other types of IBM Systems Network Architecture (SNA) sessions on an IBM 370, System/36, 38 or 8100 or a Tandem Computers, Inc. host, according to Scott Palmquist, Netlink's product marketing manager.

SNA Hub can route sessions among multiple hosts that can be attached over either a local link or a Synchronous Data Link Control (SDLC) remote dial-up or leased-line connection, Palmquist added.

Gracious host

SNA Hub provides host access for up to 64 physical units, which can include IBM Personal Computers, other IBM hosts and IBM 3174 cluster controllers. Those 64 physical units can be running up to 200 concurrent sessions, however: For example, an IBM PC or Personal System/2 can be running up to five concurrent host sessions on IBM's 3270 workstation program, and multiple terminals can establish host sessions via a networked 3174, Palmquist said.

"A lot of people have announced gateways with both 3270 and LU6.2 support, but a lot of the other gateways are PC based and don't have the Hub's capacity" to support multiple devices and sessions, said Steven Randesi, chairman of Saratoga, Calif., consulting firm Gen2 Ventures.

SNA Hub gateway's real competition will come from a new and more powerful generation of local-area network gateways running OS/2 Extended Edition, which IBM and other vendors are expected to announce when the operating system is complete, Randesi said.

The new SNA Hub Version 2, which reportedly will offer 2.6 times the performance of the earlier SNA Hub model as well as Token-Ring support, is priced starting at $12,995. The Token-Ring board and software for the SNA Hub are priced at $1,250. Both products are scheduled to be available in May.

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Users stall OS/2 plans

Corporate developers stick with ready options

BY DOUGLAS BARNEY
CW STAFF

Although Microsoft Corp. has pitched OS/2 as a panacea for many corporate software development ailments, few shops have begun the arduous task of writing for the new operating system, and some have recently shelved OS/2 projects.

Even though Microsoft shipped some 1,300 copies of the OS/2 Software Development Kit to corporations, most users interviewed last week said they are using it simply to learn about the operating system — not to write software.

Corporate OS/2 development is lagging for several reasons. For some, the flexibility of Unix and IBM's recent Unix backing is reason enough to write for that environment. Others said they are sticking with the MS-DOS environment because it is the most cost-effective.

Waiting it out

Even companies with great faith in Microsoft's operating system strategy are still waiting for prerelease code for the Presentation Manager graphical user interface.

Corporations working on tight budgets have often found Microsoft's MS-DOS requires less training, has lower support costs and runs on less-expensive hardware. For Westinghouse Electric Corp., budget cutbacks killed its project.

"We found it better to back down and go back to DOS to generate the applications," said Chris Brooks, senior engineer at Westinghouse.

It is a similar story at Deere & Co., which may opt for Unix over OS/2. "We are wondering whether OS/2 will be competitive, when you consider the Unix products that are coming out, such as IBM's AIX and X Window," said Ken Wedig, manager of engineering information systems at Deere.

Another user said he is opting for Unix over OS/2 because of its flexibility on Intel Corp. 80386 machines. By running on a wide variety of machines and, in some cases, letting MS-DOS applications run as tasks, Unix has clear advantages, said Rick Frye, manager of research and development at Carolina Freight Carriers Corp.

Although programmers can overcome the difficulties of writing for a new operating system, it may not be as easy to convert users of in-house software.

Difficult migration

A Midwestern firm that is among the top 10 in the Fortune 1,000 has developed a system for users that provides one-keystroke access to applications as well as fast access to hosts. In fact, some users are already attached to multiple hosts, a manager in the firm said.

The firm has chosen not to move the application to OS/2 because of the difficult migration involved, the manager said.

Those with the greatest commitment to OS/2 are still waiting for the Presentation Manager. In the meantime, these firms said they are looking at Microsoft Windows, which reportedly offers an early peek at the Presentation Manager interface and programming techniques.

"I've been learning Windows with the assumption that it will be easy to move to the Presentation Manager," said Charlie McLoughlin, Touche Ross & Co.'s software support manager.

Senior writer Alan J. Ryan contributed to this report.

Pioneers on OS/2 trail

Despite the problems and alternatives, some pioneering firms are writing for IBM and Microsoft Corp.'s OS/2 now.

Peat, Marwick, Main & Co. has already completed three OS/2 applications that are in use, according to Tom Cornell of Peat Marwick's airport consulting services area. Because many of Cornell's applications are ports of existing mainframe programs, OS/2's large memory offers a perfect fit. "We don't have to finesse things into working," he said.

Another OS/2 believer is Robert Metz, senior technical analyst at Whirlpool Corp. Metz is currently working on a "common controller for passing data from the factory floor to an IBM mainframe." The strongest draw to OS/2 for Whirlpool's application is its multitasking. "Now, we can break it up into multiple tasks, such as host communications, factory floor equipment communications and operator control," he commented.

DOUGLAS BARNEY

NCR System 10000 boasts PC integration

BY STANLEY GIBSON
CW STAFF

NEW YORK — Trumpeting clustering features and personal computer connectivity, NCR Corp. revamped its I series of departmental systems last week to span four models serving from two to 1,000 users. The new System 10000 is based on NCR's ITX operating system and covers a performance range of 1.3 to 5 million instructions per second (MIPS).

Designed to run current ITX applications, the new models are priced from about $31,000 to $227,000 for base configurations. The systems range in memory from 2M to 32M bytes.

There are four models in the series: the Models 35, 55, 65 and 75. The Model 35 is capable of 1.3 MIPS, which is equal to the performance of the 9400 IP system, according to the vendor. Available immediately, the Model 35 is a replacement for the 9200. The Model 55 has the same performance level as the Model 35 but has additional configuration and expansion options. It is slated to be available in the second quarter.

NCR said the Model 65, available in the third quarter, is capable of 2.5 MIPS and can support up to 760 terminals. The Model 65 is the only field-upgradable processor in the series and can be upgraded to the dyadic Model 75, which is slated to be available in the second quarter and is capable of 5 MIPS. The Models 55, 65 and 75 replace the older Models 9300 and 9400.

New computing range

NCR's System 10000 series presents options for small to large work groups

	MIPS*	Number of users	Maximum memory (in bytes)	Base price
Model 35	1.3	Two to 16	4M	$31,210
Model 55	1.3	Six to 198	8M	$48,700
Model 65	2.5	24 to 760	24M	$121,700
Model 75	5	24 to 1,000	32M	$226,900

* Millions of instructions per second

INFORMATION PROVIDED BY NCR CORP.
CW CHART

Clustering capability

The clustering feature comes with Release 6.0 of ITX, which is required for the new systems. Release 6.0 is also available to previous I series users. Any Multibus system running Release 6.0 can cluster with any other such system that has up to four processors, NCR said.

A four-processor cluster of Model 75s offers a theoretical maximum of 20 MIPS. However, that total is reduced by 5% to 8% in practice due to clustering overhead, said Khaled Marrei, assistant vice-president of ITX and Unix systems at NCR.

The system uses ITX Windows, which is based on Microsoft Corp.'s Windows, and allows a PC user to perform a job on the host or PC, Marrei said. The system currently supports the IBM Token-Ring network standard, although Ethernet support will be offered later, according to NCR. NCR will also later support IBM and Microsoft's OS/2 and the Microsoft LAN Manager, Marrei said.

"It is evident that the PC is the workstation of choice. But the full potential of the PC is only realized when it becomes part of the entire data processing network," he said.

"It's an effort to rejuvenate the ITX line. NCR sold more Unix systems than ITX systems," said Michael Geran, an analyst with Nikko Securities Company International, Inc. in New York.

OS/2

FROM PAGE 1

the company's Austin, Texas, laboratories, according to IBM's Harrington.

One corporate MIS manager who saw a demonstration said the product's final design appeared set but was still missing some pieces, such as Cobol programming tools, which may not be available for another year. He said he believes this is a drawback because OS/2 will be popular with Cobol programmers.

The MIS manager said the data base portion of the program did not seem complete and that the program's SQL implementation did not allow users to fully communicate with the mainframe. "At this point, [the data base portion of OS/2 Extended] isn't amazingly different from Paradox or similar data bases," he said, referring to one of Borland International's data base products.

Until several compelling applications for OS/2 become available, some MIS managers are not even weighing the pros and cons of buying the system.

"We haven't even contemplated it," said Warren Camp, supervisor of information services at Tenneco Oil Processing and Marketing in Chalmette, La. "I just don't see how it fits in."

"I am more concerned with the new IBM systems and price changes" than with OS/2 Extended Edition, said Jeff Ehrlich, General Electric Co.'s manager of product technology. "No one has explained to me yet what the downside would be to wait six months or even a year" to implement OS/2.

While most MIS managers are not sure of their level of commitment, most said they are gearing up for it by buying Intel Corp. 80286- and 80386-based systems with the speed and potential memory capacity that OS/2 requires.

Analysts said they do not expect any widespread acceptance of the Extended Edition by corporate accounts during the next year or two. The Yankee Group, a Boston-based market researcher, reported that it does not expect more than a 15% penetration of the program on 80286- and 80386-based machines by 1991.

Future uncertain

"We don't anticipate any wholesale adoption. A lot will hinge on the ultimate functionality of the LAN server," said Michael Gould, a software analyst for The Yankee Group. "It's just too early to speculate."

"We make sure that anything we buy now can run either OS/2 or something like it," said Larry Stouder, information center manager at Continental Grain Co. in New York.

One of those alternatives is Unix. One MIS manager said he preferred Unix's more flexible multiuser capabilities and its ability to run both Unix and DOS-compatible applications simultaneously.

"Where the big benefits come in with Unix, as opposed to a network arrangement under OS/2, is that you can use the vendor's asynchronous terminals, which cost $400, as opposed to traditional PC equipment in the network," Carolina Freight's Frye said.

OS/2 has several advantages over AT&T's Unix System V, according to IBM's Harrington, including compatibility with the much larger base of DOS applications and a full platform for IBM's Systems Application Architecture (SAA). He added that IBM's version of Unix, AIX, will provide extensions that will be consistent with SAA.

Most MIS managers contacted said they believe less costly OS/2 functional work-alikes will be available soon after IBM delivers the various versions of OS/2 Extended Edition.

Senior Editor Douglas Barney contributed to this report.

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COMPUTERWORLD

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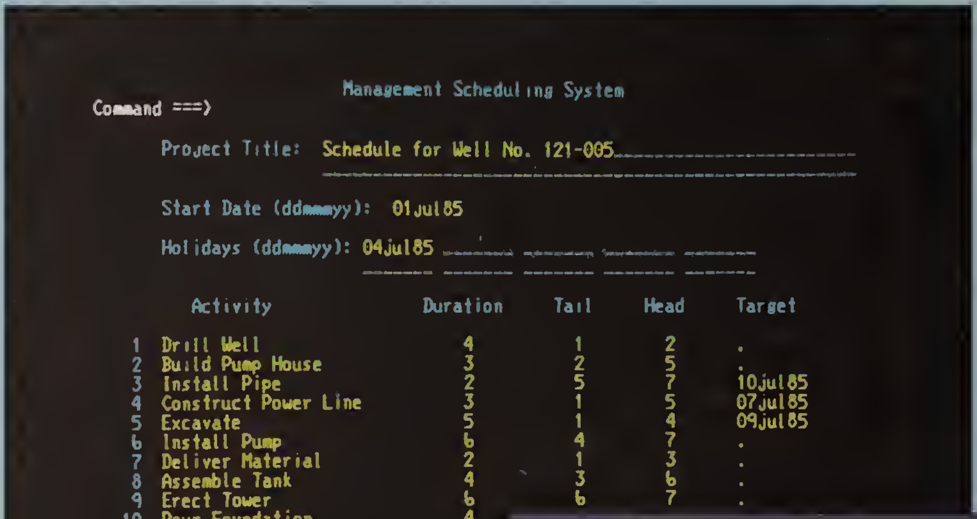

```
                         Management Scheduling System
Command ===>

     Project Title:  Schedule for Well No. 121-005_______________________
                     ____________________________________________________

     Start Date (ddmmmyy):  01jul85

     Holidays (ddmmmyy): 04jul85 _______ _______ _______ _______
                         _______ _______ _______ _______ _______

        Activity                 Duration    Tail     Head     Target

  1  Drill Well                     4          1        2        .
  2  Build Pump House               3          2        5        .
  3  Install Pipe                   2          5        7      10jul85
  4  Construct Power Line           3          1        5      07jul85
  5  Excavate                       5          1        4      09jul85
  6  Install Pump                   6          4        7        .
  7  Deliver Material               2          1        3        .
  8  Assemble Tank                  4          3        6        .
  9  Erect Tower                    6          6        7        .
 10  Pour Foundation                4
 11  ______________________        ___
 12  ______________________        ___
 13  ______________________        ___
 14  ______________________        ___
 15  ______________________        ___

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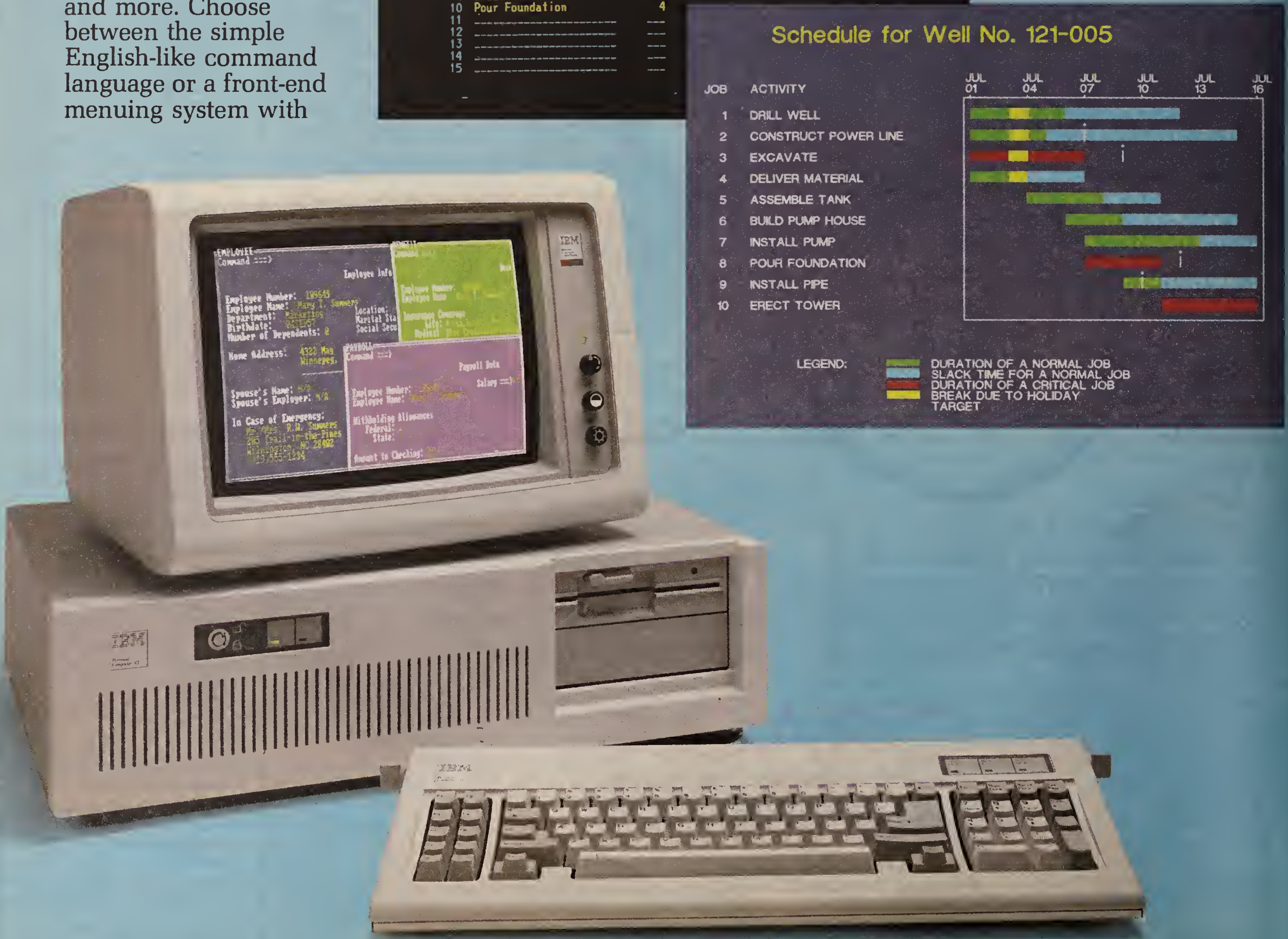

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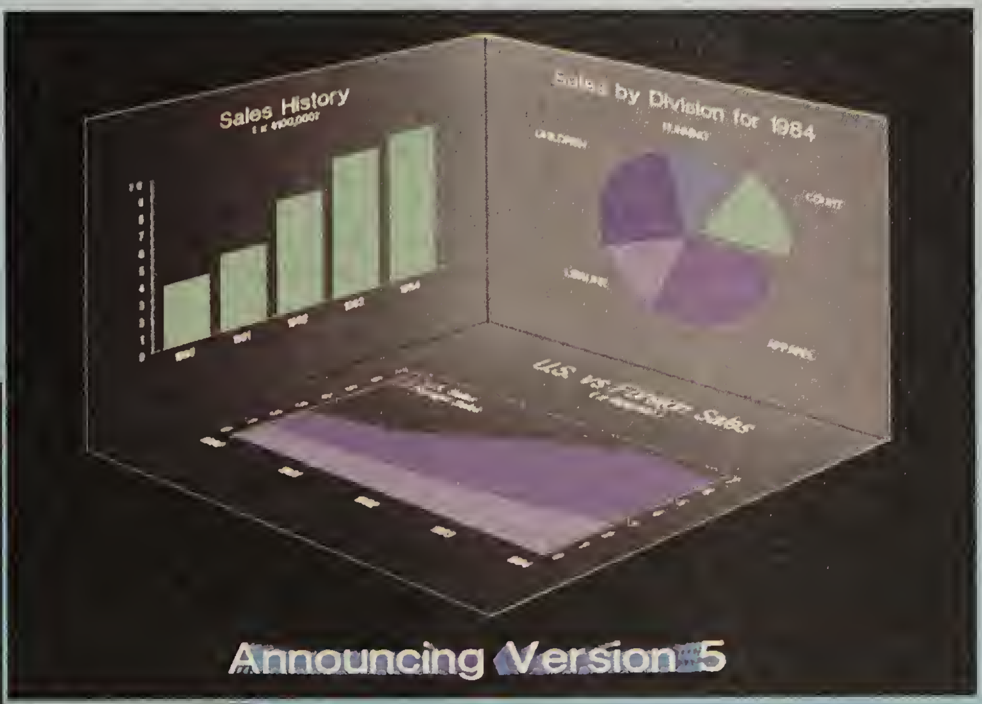

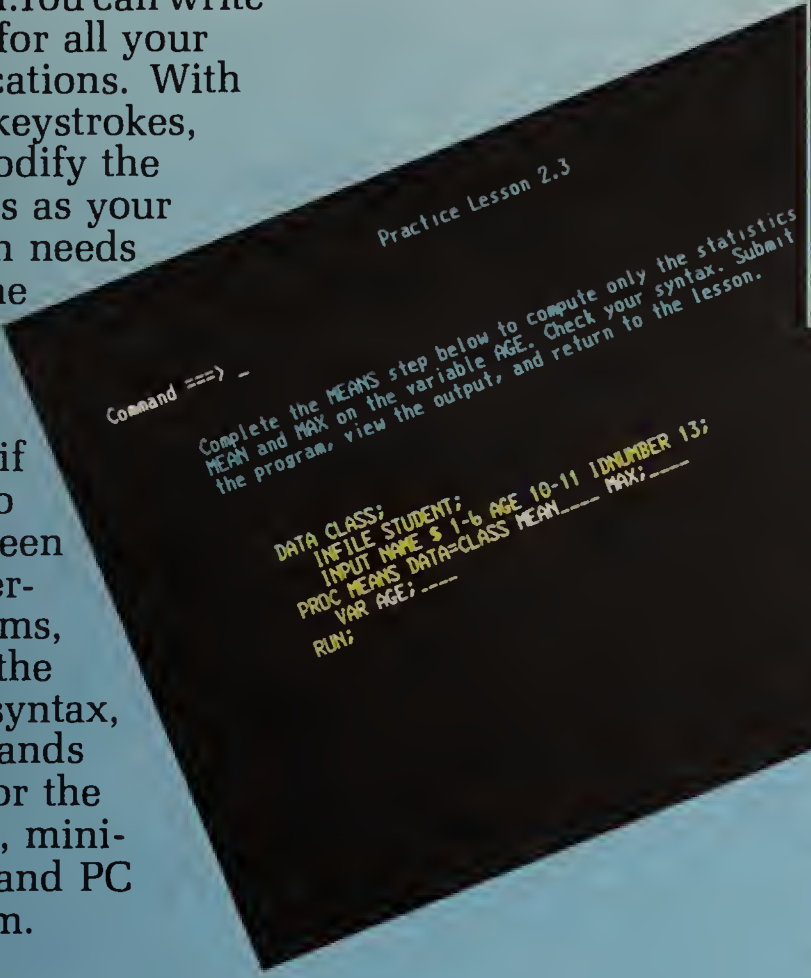

```
Practice Lesson 2.3

Command ===> _

Complete the MEANS step below to compute only the statistics
MEAN and MAX on the variable AGE. Check your syntax. Submit
the program, view the output, and return to the lesson.

DATA CLASS;
   INFILE STUDENT;
   INPUT NAME $ 1-6 AGE 10-11 IDNUMBER 13;
PROC MEANS DATA=CLASS MEAN____ MAX;____
   VAR AGE;____
RUN;
```

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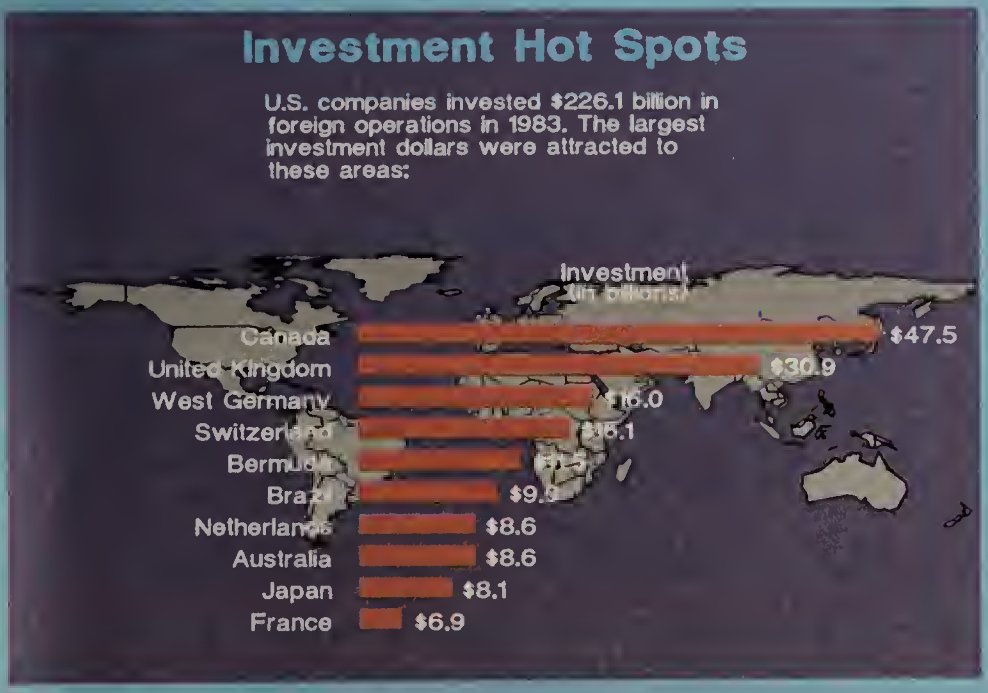

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Telecom to blossom as users' focus shifts

BY KATHY CHIN LEONG
CW STAFF

BURLINGAME, Calif. — Amid the depressing economic backdrop of the $150 billion U.S. trade deficit and warnings that the Japanese will rapidly surpass the Americans in technology, there is still plenty of opportunity ahead for communications firms that can relate to and understand corporate users.

This was the official word reiterated at the Communications & Computers Financial Outlook Conference, which was held here and sponsored by Technologic Partners and Kidder, Peabody & Co.

"In the 1990s, users will be moving away from focusing on the transport layers and will be giving their attention to applications," said Dixon Doll, consultant and chairman of the DMW Group. "Telecommunications in the Fortune 500 will move from the tactical to the strategic."

Added William Rich, an analyst at Northern Business Information, Inc., "Users need to cut costs, and they want to use their networks as competitive weapons."

As the voice communications and data worlds blur, MIS directors are becoming more involved in decision making, Rich said. "Decision making will be moving out of the hands of the telecom manager and into the power of the MIS director."

With that in mind, industry trends in the 1990s will pave the way for successful start-ups that prove they can trim the MIS budget. There will be increased demand for service companies and products in network management as voice and data networks become increasingly complex, Doll noted.

Seeking control

Research by Northern Business Information in New York suggests users are looking for network management systems to provide high-level control over multivendor environments. "Network management represents many markets," said Jim Anderson, a partner at Merrill, Pickard, Anderson & Eyre. "There will be plenty of opportunity for companies, and they won't require a lot of money."

Other areas opening up will follow emerging standards, such as Integrated Services Digital Network, the ISO's Open Systems Interconnect (OSI) and Electronic Data Interchange (EDI). For example, early OSI player Retix, based in Santa Monica, Calif., entered the market in 1985 and has already secured more than 80 customers and been consistently profitable for the last eight quarters, reported Andy DeMari, Retix's president.

As evidenced by Network Equipment Technologies Corp., the wildly successful T1 multiplexer company in Redwood City, Calif., users will put up capital to maximize use of their T1 and T3 lines in the '90s. As T1 prices continue to drop, users will be taking advantage of T1 lines as local transmission facilities — not just backbone networks.

Seafirst Bank, based in Seattle, is using T1 multiplexer technology from Stratacom, Inc. in Campbell, Calif., for local access to bank branches, according to William Stensrud, vice-president of marketing at Stratacom.

As vendors accept the fact that their systems must coexist in user sites with other machines, the bridge and gateway markets will gain momentum. "I expect there to be explosive growth here," DMW Group's Doll said.

Getting into 'groupware'

Along with openings in the wide-area networking market, the local-area network industry will provide new channels for entrepreneurs. A new class of software applications called "groupware" will emerge, giving users the ability to work on the same project simultaneously, predicted Nat Goldhaber, founder of TOPS, a Sun Microsystems, Inc. networking subsidiary. Electronic mail is one network application in the groupware category.

As users become more sophisticated, their expectations and requirements for LANs will grow, observers said. According to Doll, the individual microcomputer data base is now giving rise to the LAN data base that supports SQL. Companies such as Excelan, Inc. have forged joint-development relationships with mainframe data base vendor Oracle Corp., based in Belmont, Calif.

As standards emerge, products will look more and more alike. Network nodes will become almost indistinguishable from one another. Hence, an increasing factor for success will be to provide excellent service, according to analysts who spoke at the conference. "You have to be a service provider and less a purveyor of product," Northern Business's Rich stressed.

Said William Davidow, general partner of Mohr, Davidow Ventures: "Service is the next battleground for corporate survival."

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Stellar enters super-graphics fray

BY STANLEY GIBSON
CW STAFF

CAMBRIDGE, Mass. — Stellar Computer, Inc. in Newton, Mass., fired the third salvo in the desktop supercomputer war last week by announcing the Graphics Supercomputer Model GS1000.

Although following its West Coast archrival Ardent Computer Corp. and East Coast competitor Apollo Computer, Inc. by two weeks on the announcement timetable, Stellar plans to top both rivals by shipping its workstation by the end of this month. Ardent said it will ship its Titan workstation in the fourth quarter, and Apollo is aiming for the same time frame.

"We are going for the roses with this one," said Stellar Chairman and Chief Executive Officer John William Poduska, a founder of Prime Computer, Inc. and Apollo. "We plan to be a $400 million to $500 million company in four or five years. There is also a chance we could be a zero-million-dollar company. But I can tell you, we won't be a $50 million company."

Caters to engineers

The Stellar system was designed for engineers in need of high performance for both graphics and computation. Typical uses are expected to be in such fields as mechanical computer-aided engineering, molecular modeling and computational fluid dynamics.

According to Poduska, engineers currently using a three-dimensional graphics workstation in conjunction with a minisupercomputer are plagued by narrow bandwidths between systems and different programming environments on the various machines. In addition, their cost is typically $250,000 per user, he said. In contrast, a Stellar system performing both graphics and computation can be had for as little as $98,000.

Stressing the system's high bandwidth, Poduska said the GS1000 contains a data path that transfers data to and from the main memory at 512M byte/sec. and to and from the cache memory at the same rate.

The system's microprocessors are configured to perform both parallel and vector processing, and it uses a Convex Computer Corp. vectorizing compiler to prepare code for vector processing, Poduska added.

The GS1000 can perform 40 million floating-point operations per second at peak performance. The system is capable of 20 to 25 million instructions per second of average scalar performance, Stellar claimed.

In graphics, the GS1000 can reportedly form a picture with 64,000 pixels per side. It can also perform 600,000 vectors per second. An antialiasing feature is included but causes a decline in performance, Stellar said. The system comes configured with 16M to 128M bytes of main memory.

It will take time for a leader to emerge in the new market for these types of systems, according to Vicki Brown, an analyst at International Data Corp. in Framingham, Mass. "I am very confident that neither Stellar nor Ardent will emerge as a leader for a year; their graphics and floating-point performance is very similar," she said.

Apollo's workstation will not be fully competitive with Ardent's and Stellar's until the first quarter of 1989, Brown added, but Silicon Graphics, Inc. in Mountain View, Calif., has promised a competing system by the end of this year.

In addition to its main computing engine, the Stellar workstation includes an Intel Corp. 80386-based subsystem connected to the main processor by an IBM Personal Computer AT-compatible bus. The micro also runs Microsoft Corp.'s MS-DOS and Windows and allows a user to run a spreadsheet or word processing as a window on the workstation.

The GS1000 runs the Stellix operating system, Stellar's version of Unix.

Part of Poduska's pitch was to paint a rosy picture of future enhancements and additions to Stellar's product line.

He said Stellar will offer a machine twice as powerful, but priced the same as, the GS1000 a year from now, followed by a similar price/performance increase a year later.

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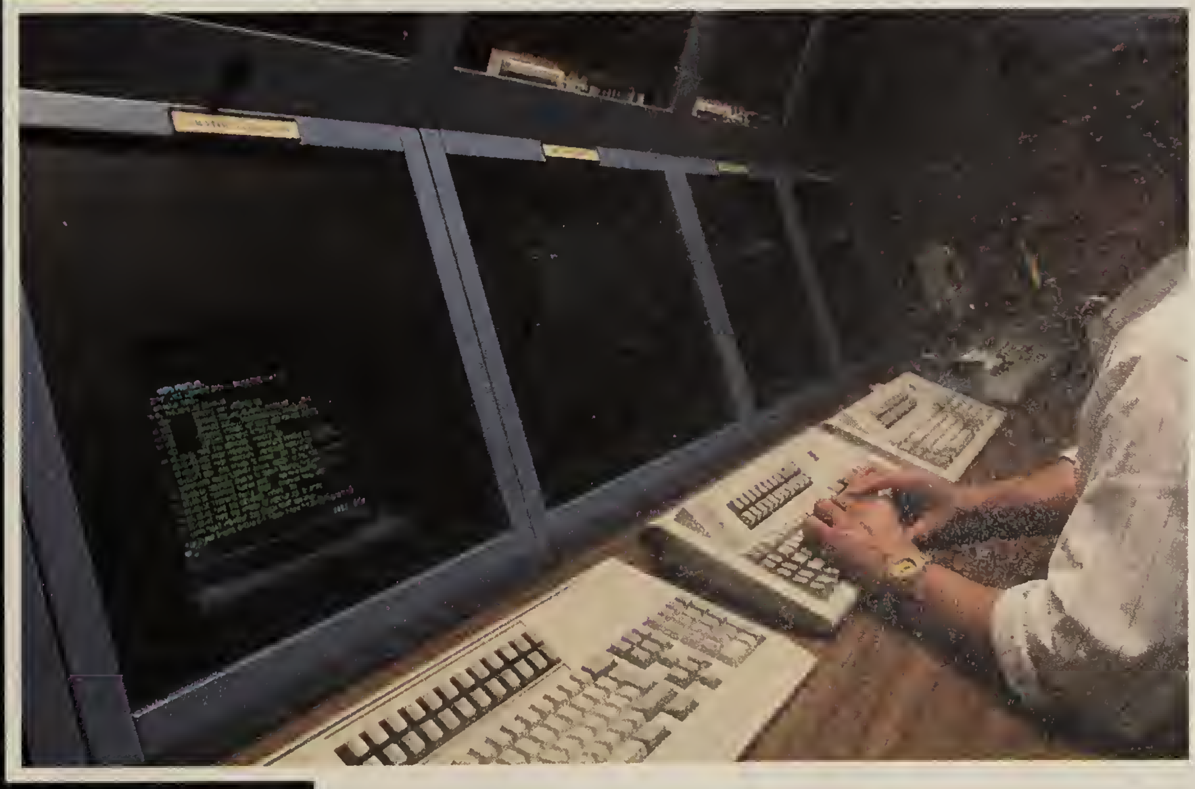

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EDITORIAL

Ports in a storm

With its formal entry into the mainframe market two weeks ago, DEC served notice that it believes it can beat the industry's most formidable competitor on its home turf. DEC's confidence is admirable, but its reasons for attacking IBM directly may have as much to do with market realities as with competitive nerve.

Surveys are now showing that enthusiasm for departmental computing may be beginning to wane. A recent Yankee Group study revealed a surprising surge of interest in mainframes [CW, Feb. 29], and a Sierra Group study released last week shows that minicomputers are taking a hit from below as increasingly powerful network servers take on more of their functions. In contrast, users' mainframe and PC purchasing plans remain strong, the surveys note.

It is doubtful that these trends have escaped DEC's sophisticated research operation. The firm's aggressive moves into the mainframe and super workstation arenas show that DEC wants to diversify to minimize its vulnerability in the mid-range. Fortunately for DEC, its VAX family and VMS operating system are strong platforms on which to do so. But DEC will face the fury of IBM in the mainframe market as it never has before, and its PC offerings continue to be all but nonexistent. DEC would like to find safer harbors in the event of a storm, but it will discover the waters it must navigate are rocky indeed.

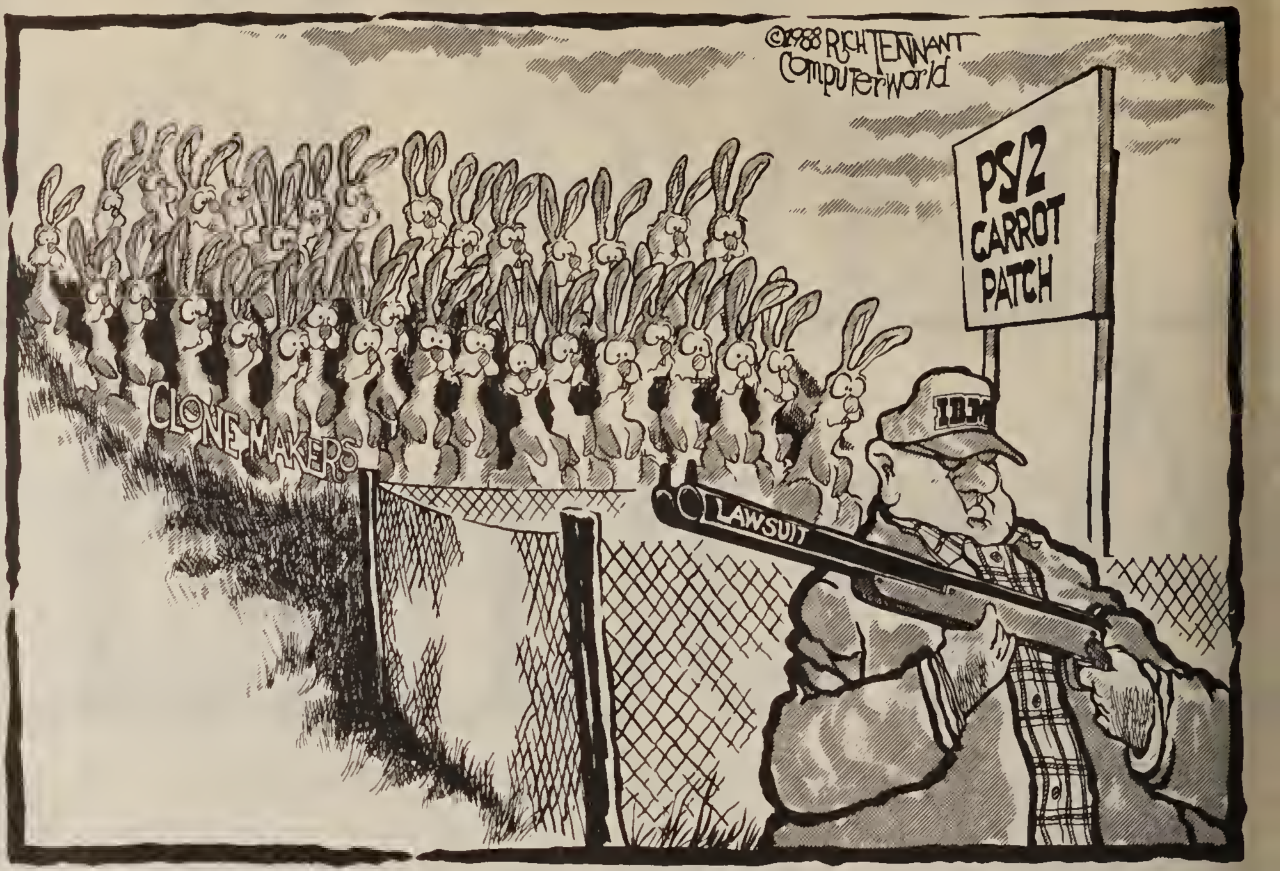
Ready or not

Generally, markets for new computer products emerge before the industry really recognizes the opportunity. The current flood of workstation products offering single-user supercomputing power represents an investment of hundreds of millions of dollars for a market that nobody really has a fix on yet.

The introduction of mega-MIPS machines by Apollo and West Coast start-up Ardent [CW, March 7], followed by last week's announcement by East Coast start-up Stellar, could augur the next boom in placing power at individual users' fingertips — or could be as big as the relatively disappointing letdown of the laptop PC.

As much as anything, interest in these systems seems to have less to do with pent-up user demand than with the storied histories of Ardent chief Allen Michaels and Stellar boss William Poduska. As Gene Amdahl's failed quest to claim a triple crown with Trilogy Corp.'s promise of wafer-scale semiconductors for huge mainframes proved, venture capitalists are sometimes taken as much by a resume as by a solid business plan.

But if there is indeed a market for $100,000 workstations, we could be watching the beginning of a new era in computing. If not, it will be just one more example of restless entrepreneurs running on too much adrenaline and easy cash.



LETTERS TO THE EDITOR

Enviable position

I want to comment on the Con section of "Why the Mac will win," by John Xenakis [CW, Jan. 25].

The author said IBM is apparently willing to allow companies to share in Microsoft Corp.'s MS-DOS pie. He seemed to believe IBM set out with this as its strategy. I think it is clear to many observers that IBM did not have personal computers in its long-term strategic plan in the early days. It saw a market opportunity and rushed to assemble a product that it could get to market quickly. To accomplish this, it used existing chips and operating system software from other companies and thus created a cloneable machine.

It is interesting to note that Xenakis argued that Apple Computer, Inc. should also have cloneable machines. From a business perspective, this would cut Apple's attractive profit margins. The author commented that Apple seemed to want to keep the Macintosh market to itself. This is an enviable competitive position with the ability to sustain those high margins. I don't know many businessmen who would disagree.

Xenakis also credited the new Presentation Manager software from IBM and Microsoft as being 90% of the way toward merging the IBM Personal Computer and Macintosh user interfaces. I agree that this may make the desktop file management look similar, but what about the commonality of all application software? It is likely to take a long time for that to look comparable to the end-user community.

John M. Keelin
Dravo Corp.
Pittsburgh

The address is . . .

I am writing in regard to the news brief on Northwest Airlines that appeared in "Inside Lines" [CW, Jan. 25].

Northwest Airlines is not headquartered in Minneapolis. The airport in the Twin Cities is Minneapolis/St. Paul International Airport. Its City/Airport Code is MSP, which stands for Minneapolis/St. Paul.

Northwest's address at MSP is St. Paul, 55111. Northwest's new world headquarters is in the St. Paul suburb of Eagan.

References to this metropolitan area should always include both St. Paul and Minneapolis.

Paul Perrault
Mendota Heights, Minn.

Part of reality

I would like to add some clarification to Hadson Gas Systems, Inc.'s position on its local-area networks and other networks as described in Aaron Brenner's "Reality falls short of hopes" [CW, Jan. 25].

The LAN is being used strategically as the bridge from the personal computer-based operating system to a data base transaction processing application system. Our objective is to use the LAN and wide-area networks to also support a virtual terminal network for the application system.

The product will be a LAN network that works closely with the data base applications system on Hewlett-Packard Co.'s HP 3000; the PCs will provide distributed processing power for spreadsheets, graphics and word processing and also serve as terminals for the application. Other utility software will provide the link for exchanging data between minicomputers and PCs, tying the two environments together.

Hadson Gas is pleased with the performance, capabilities, cost, flexibility and strategic position of twisted-pair. Combined with Starlan and the HP 3000 environment, it is meeting our needs quite well.

We feel the problem of the PC configuration management is common to all LAN environments and is a given in the PC world.

For Hadson, reality has not fallen short; the reality is that LANs require work just like most other computing problems.

Ray Thomas
Office Automation Manager
Hadson Gas Systems, Inc.
Irving, Texas

Multiple solutions

As an information systems manager in the health care field, I read with interest the article, "Shaking off 15 years of DP-as-usual" [CW, Jan. 18]. While the title is accurate, the article could have included additional relevant information.

First, the perspective of hospitals' executive management should be an important part of articles such as this, since information systems should be evaluated by their effectiveness as tools for operating the business. Second, there are significant efforts under way to allow multiple

Continued on page 22

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

Users will be victims if IBM source code battle rages on

DAVID TORY

IBM's Object Code Only (OCO) policy has become a focal point of debate, argument and confrontation. The software industry, as represented by ADAPSO, says that availability of source code for IBM's mainframe systems software products is absolutely mandatory. IBM says its source code is a company asset that must be protected. However, there is middle ground that should enable these protagonists to reach a mutually beneficial accommodation.

Source code has become a heated issue because it is a convenient battle flag around which the software industry can rally and against which IBM can create a blanket of defense.

Unfortunately, if the software industry places too much focus on the need for source code, it could dissipate the energy it needs to counter the real challenges that independent software vendors face with IBM.

Information vs. code

The independent software vendor has a real need for product-related information from IBM. ADAPSO believes, however, that information is available for any specific product only within the source code for that product; the organization is confusing source code with the information we need to build products that add value to IBM's software solutions.

If IBM provides the information software developers need to link into IBM products, then we don't need the source code. The fact that IBM will not change its mind on this issue means we must work with the company to define our specific information needs.

As long as we talk about a generic source code issue, we aren't helping ourselves. As long as we insist on dealing with the problem as a source code issue, we'll have difficulty persuading IBM to provide a mechanism for proper information interchange.

The information we need can be broken down into the following three areas:

- Descriptions of the control blocks, functions and other interfaces to which we would connect our software.
- User exits at key functional points that allow value-added software to function.
- IBM's living up to its commitment to supply the same information to us, as independent party vendors, that it supplies to its internal developers.

With regard to this commitment, IBM has told the industry that each software development group inside IBM is effectively self-contained with respect to interfaces to other products. The only information that would be provided to the IBM development team is information that should also be made generally available to the independent software industry.

IBM break its own rules?

If IBM plays by the rules it has established, then the software industry can be confident that it has access to the same information that IBM developers use.

If, on the other hand, IBM shortcuts the rules that it has defined, then the whole process breaks down.

IBM is in a position to make one set of rules for the outside and one for internal development. That puts the independent software developers at a critical disadvantage. If there is such a conflict, IBM must resolve it. A properly prepared case identified to IBM, rather than an ineffective scream of outrage, will greatly assist in resolving that problem.

> IT IS very difficult to force any company to act in a statesmanlike way when the people who want its help are also making nonspecific accusations about the company's motives.

To my knowledge, during the five years since the OCO policy was announced, when a valid need for information has been presented, IBM has acted accordingly.

For example, when IBM created new sort instructions within microcode, the change mattered to our CA-Sort product. We learned of the change and asked IBM about it.

IBM said, "Yes, the change has been made, and here's the information you need to use the new instructions." IBM made that information available to the entire industry.

There is another problem that is currently best resolved by the availability of source code: The demand, from users and independent vendors alike, for a means for themselves to provide some level of technical support of IBM's software — specifically, to shortcut the debug problem diagnosis and resolution process.

IBM's perception is that if it supplies bug-free code, then the problem does not exist. If it supplies code that contains bugs but responds quickly and effectively with fixes, then source code is not needed. It is only when a problem occurs while alien software is co-resident — and IBM does not accept responsibility for resolving the problem — that source code is needed.

An example arose a while back, when our CA-Optimizer product had a conflict with CICS. We were able to find the bug in CICS because we had CICS source code. We did the job of debugging IBM software because IBM wouldn't. IBM has recognized the problem and gone part way toward a solution.

IBM realizes that when it provides a product under its Early Support Program (ESP), the new software must interact with independent software. Each ESP customer is allowed to identify the independent software that is critical to that client's production environment, and the customer is allowed to make use of the independent software during ESP testing.

It's not that big a leap for IBM to go the rest of the way and continue to fully support its software when independent software is present.

Continuing negotiations

The independent software industry needs to continue a reasonable dialogue with IBM. It makes little sense to be unnecessarily combative. It not only damages our relationship with IBM but also affects the credibility of the industry and does nothing to help our customers.

There are too many real issues associated with IBM's dominant and potentially anticompetitive position for us to needlessly destroy that dialogue. Our industry needs IBM to continue providing new hooks and interface documentation to all its systems software. We need the company to respond as the dominant market leader it is when evidence emerges that it is acting anticompetitively.

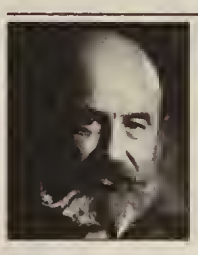
It is very difficult to force any company to act in a statesmanlike way when the people who want its help are also making nonspecific accusations about the company's motives. Industry, and especially the user, will benefit only if IBM and the independent software industry are demonstrably cooperative, not combative.

Tory is executive vice-president of planning at Computer Associates International, Inc. in Garden City, N.Y.

The doggonedest computer ever seen

Japanese unleash K9 to prove their originality

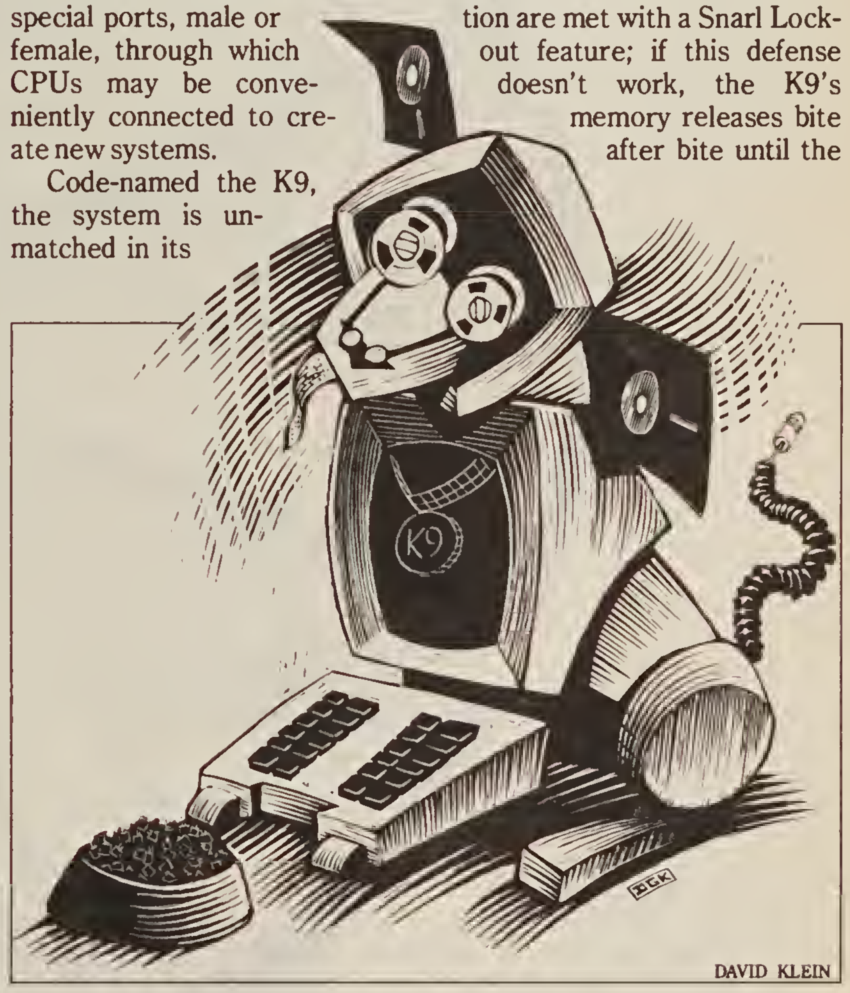
CHARLES P. LECHT



Make no bones about it, folks; the Japanese computer industry has come up with the doggonedest computer we've encountered anywhere. Announced by a secret Tokyo University research council looking into new forms of computer life, the system recently met all its certification tests as the world's first digital system capable of truly organic growth.

Each model features common I/O channels for high-speed data throughput and either one of two special ports, male or female, through which CPUs may be conveniently connected to create new systems.

Code-named the K9, the system is unmatched in its capacity to keep running, come what may; it is the ultimate in fault-tolerant fail-safe performance. The system is water-cooled when especially hot; however, it can run air-cooled for long periods through the use of its dual air-conditioning intake and exhaust ports.



DAVID KLEIN

With dual audio input channels for stereo sound recording and dual three-dimensional optical storage channels and supported by four flexible fibrous feet, the K9 has all the redundancy we may ever need to continue operation during the worst and best of times.

The K9 runs the Dog Operating System (DOS) version 3.0913467. End users will find the K9 to be very user-friendly, especially when meaty input is provided. And forget about I/O bottlenecks; the K9 never has any.

With powerful DOS commands like FETCH, OPEN, HEEL, STOP and WAIT available, the K9 performs like a champion. By design, it features natural real-time capability. As for speed, it runs so fast that it can run rings around current PCs. A built-in clock ensures automatic wake up for users who want this feature.

Fierce security features

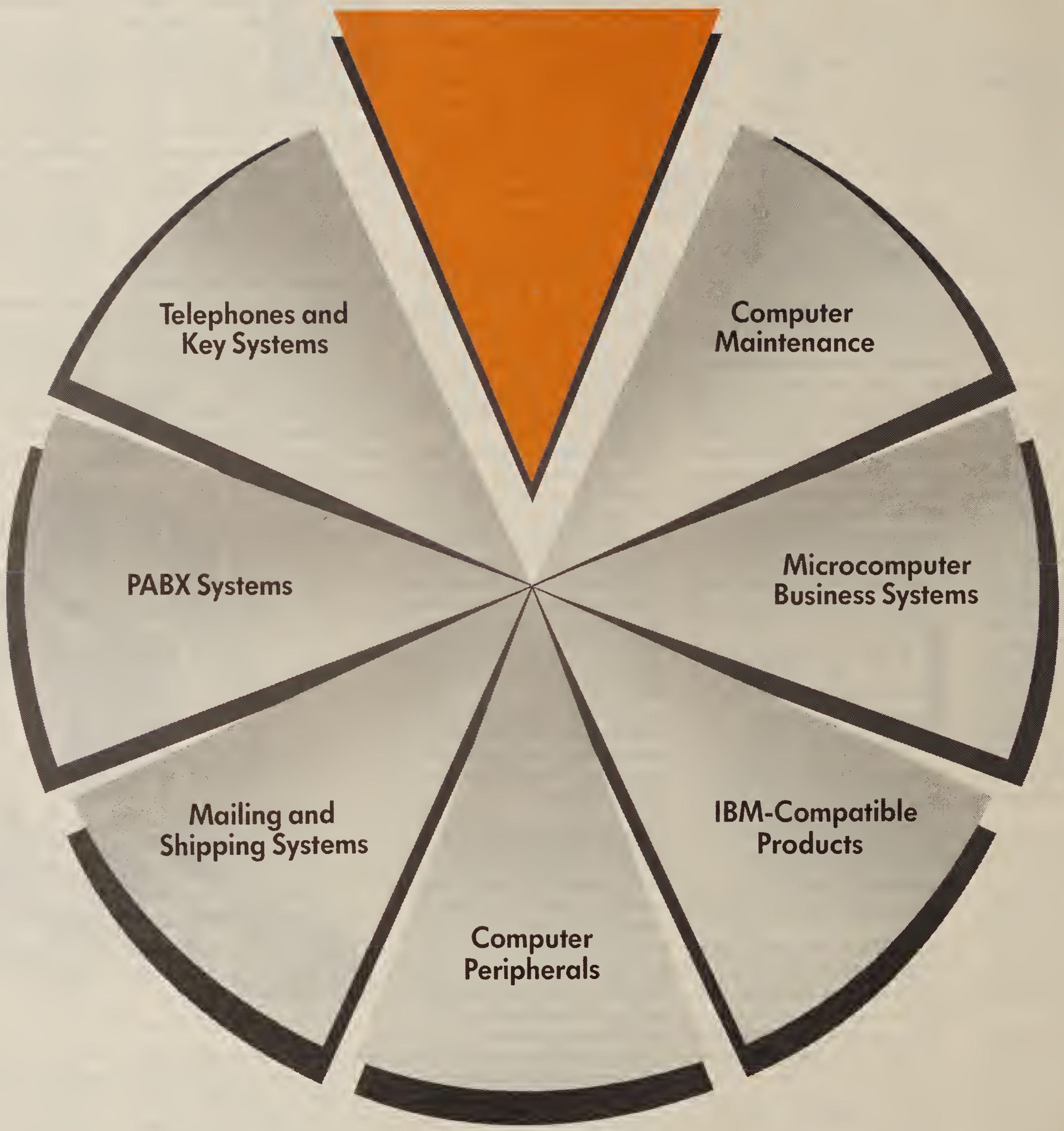
And K9 has a built-in PROTECT command with teeth. Attempts to penetrate without authorization are met with a Snarl Lockout feature; if this defense doesn't work, the K9's memory releases bite after bite until the would-be intruder gives up. JUMP, ATTACK and DELETE commands are available in the more advanced Extended Version, but entry-level users are forewarned to become very familiar with the STOP and WAIT commands before using these.

The K9 literally chews up and digests the most difficult problems. For example, the K9's performance in the expert systems arena is unmatched in its ability to do pattern recognition. It may be the first system that can recognize its owner.

Through its input sensory devices, the system is almost supernaturally aware of the intentions of human beings making contact with it. One thousand K9s have been ordered by the Tokyo Metropolitan Police De-

Continued on page 22

Lecht is an IDG News Service foreign correspondent based in Tokyo.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Doggonedest

CONTINUED FROM PAGE 19

partment and several other law enforcement agencies for use in early warning security systems.

WITH THE ANNOUNCEMENT OF THE K9, the Japanese scientific community has offered ample evidence to refute any charges that there is a lack of innovation within its ranks.

In the army now

The Japanese Self Defense Forces also plan to use the K9 in more advanced military applications, like those commonly referred to as war games. Highly interactive and capable of emitting a wide variety of sounds, the K9 provides military users with just about all the attack and defense action they may ever need or want in one system.

When it comes to artificial intelligence, the K9 has no competition. A series of routines invented by Soviet scientist Pavlov come with the system to imbue it with classic stimulus and response capabilities.

If one wishes to invoke the system, a built-in American-inspired randomness routine assures unpredictability in the K9's behavior, causing it to offer new solutions to the same problem in evermore differing ways.

What about communications? Can the K9 communicate, and if so, which protocol does it use?

First of all, the K9 can shake hands with just about anyone inclined to make contact with it. Once it verifies that there's no cause to defend itself, the K9, through its emitter control logic brain, can send and receive in asynchronous, bisynchronous or mixed-mode simultaneous voice and data.

Housed in a very simple box-like facility, the K9 will fit on most executives' desks, but floor models are recommended.

Further, the K9 is weatherproof, so it can run in rain and snow.

Rainbow of colors

And talk about color. The K9 comes in most solid and mixed colors. Reds, browns, whites, yellows, you name it; K9s come in all of them or mixtures of as many as five. Spotted K9s are also available. Of course, if you wish basic black, that's OK.

Field-tested standard and hybrid models are now available for export to qualified dealers. K9 training materials are available in English and Japanese. A K9 users group meets Thursday evenings in a field near Yoyogi Stadium.

With the announcement of the K9, the Japanese scientific community has offered ample evidence to refute any charges that there is a lack of innovation within its ranks. The K9 is truly outstanding in its field.

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CONTINUED FROM PAGE 18

systems from multiple vendors to interact as an integrated whole — the health care equivalent of the Manufacturing Automation Protocol and Technical and Office Protocol. The article left the impression that the trend is toward fewer vendors, while the opposite is also true.

Since administrative needs have historically been the major economic driving force, systems designed around charge capture have dominated computing expenditures. Actual clinical information has seldom been automated beyond physician viewing because of administrative priorities and significant differences between administrative and clinical data.

A system designed primarily to generate a bill is hard-pressed to manage work loads and costs within specialized departments, such as lab, pharmacy and radiology, and is even harder pressed to address the clinical quality of care needs that must parallel cost-control efforts. The complexity and heterogeneity characteristics of hospital departments are poorly suited to a single-vendor approach — or even a single hardware base — since the limited choices may not be the "best fit" in every area.

Multiple systems, then, are a creative attempt to address these deficiencies, but they also have their problems.

Although using the same hardware vendor may ease connectivity issues, it seldom allows each department to truly select the system solution best suited to its needs, because software is limited to the hardware standard. Furthermore, direct user ownership in a system is the major factor in its effectiveness — more than technology or outside opinions of "the best."

Clearly, there are successful efforts to tie multiple hardware and software vendors together, creating integrated solutions that, incidentally, cost less than single-vendor solutions.

James M. Gabler
Vice-President of
Management Systems
Moses H. Cone Memorial
Hospital
Greensboro, N.C.

SOFTWARE & SERVICES

SOFT TALK

Richard D. Adams

A conflict of interests

The late Vince Lombardi once said he could tell if a football player was an offensive or defensive player by watching him walk down the street. He noted offensive players tended toward structured life-styles and conservative dress, while defensive players tended toward the unstructured and the casual.

He attributed this professional dimorphism to the differences in their responsibilities. Offensive players, he said, are evaluated on their ability to execute on a "specific set of instructions," while defensive players are evaluated on their ability to think on their feet and to react to a dynamic situation.

A similar dimorphism exists between auditors and programmers. They too can often be distinguished by their dress, and they too have conflicting responsibilities.

If the business team has a defensive player, it is the programmer/analyst responsible for reacting without "a specific set of instructions" to the constant and self-perpetuating changes in user requirements. Given the timetable these programmers must work within, the situation can be frustrating — even to Mercury.

At the same time, the auditor, who is responsible for the control function of management, is attempting to determine if the programmer has deviated from a nonexistent specific set of instructions. Thus, we have the program-

Continued on page 24

Human resource vendor offers DB2 applications

BY CHARLES BABCOCK
CW STAFF

WALNUT CREEK, Calif. — Integral Systems, Inc., a West Coast vendor of human resource applications, recently started delivering its basic payroll and personnel system for use with IBM's DB2. The rewritten system, coded in IBM's Cross System Product (CSP), is one of the first software lines being delivered in IBM's fourth-generation language application generator.

"We think we're out in front of the bandwagon with CSP. We think CSP will be a winner and widely accepted as a fourth-generation language product," said Integral Systems Vice-President A. W. Duffield.

Duffield said Integral Systems has been named an Application Enabling participant in IBM's Industry Marketing Assistance Program (IMAP). There are about 200 IMAP participants, but most are hardware-oriented vendors. Integral Systems and Policy Management Systems Corp. in Columbia, S.C., are among the few that comarket software with IBM. Under the IMAP program, Integral Systems will use the IBM logo on its sales materials and collect 10% of the fees for any CSP licenses that it helps sell.

First time out

"Personnel is a good first DB2 application. It's not a high-transaction volume application. I don't believe we're going to run into any performance issues," Duffield said.

CSP is IBM's product for developing applications that can be run in the CICS/VS, MVS/TSO, VM/CMS, Small Systems Executive/VSE and 8100/Distributed Processing Executive. CSP applications can also be run under IBM's PC-DOS or OS/2 in a

Continued on page 26

Optima airs CASE

Company's debut features data base design tool

BY NELL MARGOLIS
CW STAFF

SCHAUMBURG, Ill. — Action at Ken Orr & Associates, Inc. last week centered around the front door, with a new name being painted on it just as the first commercial release of the company's flagship Design Machine front-end computer-aided software engineering tool was rolling out.

Design Machine Version 2, the first offering of the newly named Optima, Inc., is intended to automate the requirements definition phase of the software design cycle. Based on Ken Orr's Data Structured Systems Development (DSSD) software design methodology, which underlies all Optima products and services, Design Machine generates logical data base designs directly from user requirements, according to Orr.

Optima's Ken Orr

Targeted at professional software designers, Design Machine "lets MIS people build user-oriented tools that are focused on the specific needs of the user in question rather than on an academic ideal that might be elegant but have little to do with what the user actually asked for," Orr said.

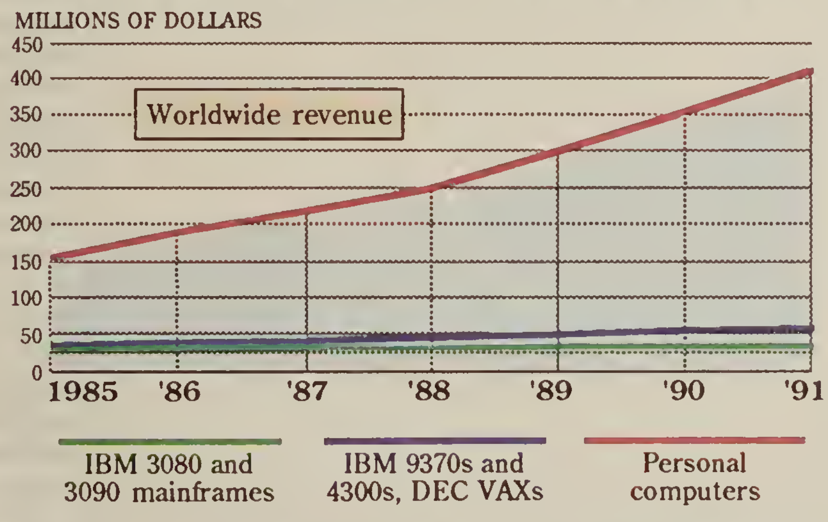
The Design Machine software, he said, lets the user select a minimum data set needed to support single-user views and combinations of user views

Continued on page 26

Data View

Word processing blossoms on desk tops

The use of word processing packages remains flat on mainframes and minicomputers, but its growth is projected to accelerate on PCs



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Landmark's Eyewitness analyzes CICS crash causes

BY CHARLES BABCOCK
CW STAFF

SPRINGFIELD, Va. — An $18,000 system that helps troubleshoot a CICS dump will reportedly be offered in April by Landmark Systems Corp.

Landmark's Eyewitness for CICS will bring automated debugging and analysis tools to bear on spotting the cause of a CICS crash, the vendor said. Instead of leafing through a massive dump printout, a systems programmer will be able to track problems on a system operator's screen.

"In a matter of seconds, we

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Inside

- ADR DBMS monitor views individual CICS applications. Page 24.
- Thorn EMI enhances financial package. Page 31.
- Precision Visuals designs interactive graphics tool for DEC VAXs. Page 31.

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ADR performance monitor zooms in on specific CICS applications

BY CHARLES BABCOCK
CW STAFF

PRINCETON, N.J. — A performance monitor that analyzes a data base management system, an operating system and a teleprocessing monitor in real-time can now monitor activity associated with a specific CICS user application.

Applied Data Research, Inc.'s (ADR) Look/Datacom, which is unusual for its ability to monitor three major systems at the same time, has been given "a finer level of granularity," according to Stephen J. Gerrard, ADR's vice-president of marketing.

"Before, the monitor looked at a CICS [application] as a whole. The reality is that many users run many huge applications simultaneously," Gerrard said.

Bottleneck opener

By zeroing in on specific applications, the monitor can help a system operator identify bottlenecks or problems associated with an individual application, according to Gerrard.

The CICS and operating system parts of the monitor now work under the IBM DOS/VSE operating system as well as under MVS and MVS/XA.

In its earlier release, Look/Datacom would have been restricted to monitoring ADR's DBMS, Datacom/DB, under VSE, according to ADR officials.

Double duty

Overall, the new release of the monitor "has roughly doubled the number of things it can do" under MVS and MVS/XA, Gerrard said.

In addition to viewing and analyzing specific applications, Look/Datacom is said to be able to review the allocation of direct-access storage device volumes I/O request rates. Someone using Look/Datacom would be able to examine the ratio between physical and logical I/O requests for each area within the data bases, ADR officials said.

In addition, monitor users can verify current Datacom/DB configuration, peak amounts of data being processed and the number of buffers. Statistics for buffers at a start-up time or over a given period of time could also be reported, the vendor said.

Look/Datacom is available immediately for processors in IBM's 370 family. It is priced at $15,200 for VSE/SP environments, $35,000 for MVS environments and $36,800 for MVS/XA environments. Short-term leases are also available, ADR said.

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Adams

CONTINUED FROM PAGE 23

mer's complaint: Without standards, both the audit and its conclusions are meaningless and, therefore, in conflict with the purpose of auditing.

At the same time, programmers are frustrated by a lack of appreciation of their performance based on results, auditors are frustrated by the absence of tangible evidence of their performance in terms of problem definitions, audit trails, test procedures, sign offs and documentation.

But the auditors' frustrations run much deeper, since there are professionals in other fields, such as marketing, engineering and product research, who also function in a reactive mode and yet are able to produce the requested audit evidence.

Education provides insight

I think an answer for the auditors' frustration can be found in the programmers' style of education. Traditional business and science courses stress methodologies with an attitude of, "If your methods are correct, the accuracy of your results is a computational function." These courses require students to provide proofs with their results and condition students to defend their methods.

In contrast, computer programming courses have traditionally stressed results. This approach encourages students to develop ad hoc methodologies and has the effect of teaching technology on the basis of "the end justifies the means."

Thus we have the auditor's complaint: Without a formal methodology, programmers can prove only that they achieved the expected results. They cannot demonstrate the basis of their results or prove that their methods were appropriate, efficient or ethical. However, that is what the auditor is going to determine.

Alone, each complaint identifies conflict created by unresponsive behavior. Together — as they usually are — they identify the chaos created by the divergent missions of both parties.

The solution lies in methodologies. Not just methodologies for auditors and programmers, but methodologies for managers who have either not recognized these conflicts or have tolerated their continuation.

Adams is a management consultant specializing in information systems and is based in Durham, N.C.

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Landmark

FROM PAGE 23

provide a synopsis of the problem and focus on what caused the crash," said Landmark President Pat McGettigan.

The system is organized around a color graphic menu with Help screens that allow the programmer to pursue the cause of a crash. The menu outlines the steps a skilled system programmer would take to resolve the cause of the crash, product director Steve Barnes said. The analysis functions allow the programmer to determine whether the crash was related to a resource bottleneck, the invocation of a CICS self-destruct rule, tainted nucleus code or some other cause.

Eyewitness is said to be able to track CICS links, such as those between CICS regions and CICS applications, since a problem with any participant in the chain could have caused a crash.

Eyewitness is Landmark's second product. Its first was The Monitor for CICS, which has an installed base of about 2,500, according to Datapro Research Corp. in Delran, N.J.

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Optima

FROM PAGE 23

across applications; normalize data into relational tables; design all required logical access paths; and document these design steps.

Following closely on the introduction of Brackets, an IBM Personal Computer-based end-user-oriented diagramming tool that lets users interactively create Warnier-Orr diagrams online, the Design Machine Version 2.0 debut and the Optima name are both emblematic of the 8-year-old software engineering and consulting company's new marketing thrust, said President Patricia A. Palmer. Capitalizing on years of consulting experience with a foundation of DSSD, Optima is offering tools, training and consulting.

Optima's Design Machine runs on the IBM PC XT, AT and compatibles with 640K bytes of random-access memory, a hard disk drive with 5M bytes or more of available disk space and Microsoft Corp.'s MS-DOS Version 3.0 and higher. It works with any monochrome or color monitor; users can select colors.

The $10,000 price tag covers a single copy of Design Machine and two complete days of Optima training. Site licenses and rental arrangements are available.

DB2

FROM PAGE 23

version of the product for microcomputers called Easy Prep and Easy Run.

Integral Systems began marketing its CSP human resources package in November 1987 and has logged six sales of the $250,000 product during its first three months of availability. The company said it expects that its DB2 products will eventually constitute one-third of its sales and 40% to 50% of its revenue. The firm said it will next offer its pension administration package in CSP.

The bulk of Integral Systems' current revenue is based on sales of its human resources product line for use with well established mainframe data base systems, which include Cullinet Software, Inc.'s IDMS/R as well as Software AG of North America, Inc.'s Adabas.

Wrong.

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NEW PRODUCTS

Systems software

Thorn EMI Computer Software, Inc. has enhanced its **FCS** financial modeling software package.

Version 2.7 features enhancements to the FCS-Manager that provide a consistent screen format throughout the product range. The basic FCS system, including FCS-Manager, costs $55,000.

Thorn EMI also introduced the FCS-Professional and FCS-Link modules. FCS-Professional is a high-end version that offers structured language that produces compact code. It runs under IBM VM/CSM and MVS/TSO as well as on Wang Laboratories, Inc. VS systems. Pricing starts at $6,000.

FCS-Link allows users to share mainframe data and access it directly by mainframe FCS or via the microcomputer-based Micro-FCS. Pricing is based on the number of multiple concurrent users. A 50-user license costs $13,000.

Thorn EMI, 285 Mill Road, Chelmsford, Mass. 01824. 617-256-3900.

A **Purchasing Management System** for the IBM System/38 has been announced by **Packagedeal, Inc.**

The system includes purchase order entry, verification and printing, outstanding order tracking and analysis, the printing or receiving of orders and receipt schedules as well as entry and editing or receivers. The system may run standalone or as a module interfaced with Packagedeal's Accounts Payable and Inventory system.

The Purchasing Management System costs $3,650.

Packagedeal, 6366 Guilford Ave., Indianapolis, Ind. 46220. 317-259-4189.

Applications packages

A graphics product designed for interactively creating, revising and displaying line drawings on Digital Equipment Corp. VAX computers has been introduced by **Precision Visuals, Inc.**

Draw: The Precision Visuals Drawing System has three interface modes for three levels of users: command mode, graphics menu mode and tablet mode. Input can come from keyboard, joystick, mouse or graphics tablet. Output can be directed to such hard copy devices as Hewlett-Packard Co. pen plotters, DEC laser printers, Tektronix, Inc. ink-jet plotters and all Adobe Systems, Inc. Postscript-based devices.

Primitives include polyline, polygon, arc, circle and library symbol. The system library contains more than 300 symbols. Transformations include zoom, pan, mirror and rotate.

Draw is priced from $3,500.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301. 303-530-9000.

Utilities

A report writer for use with Unix and Microsoft Corp. MS-DOS file structures as well as Prime Computer, Inc. Midas Plus files has been announced by **C Works, Inc.**

C-Report supports multiple files and all data type formats including packed decimal and floating point. According to the vendor, execution speeds are close to compiled language programs, with an average development time of around 10 minutes per report.

The package is priced from $495 on MS-DOS to $2,500 on large Unix systems.

C Works, Suite 301, 1705 Capitol of Texas Highway, Austin, Texas 78746. 512-327-7301.

Software Techniques, Inc. has introduced an interface between its tape/media librarian system, **Media/Schedule/Vault**, and its file archiving system, **Archive 2000**.

Media/Schedule/Vault is a set of software packages designed to automate off-line short-term data storage procedures. Archive 2000 allows information to be taken off-line for long-term storage in an archive.

Designed for use in Digital Equipment Corp. VAX/VMS environments, the software also supports single, clustered or networked VAX systems.

Prices range from $2,200 to $8,250.

Software Techniques also added a technique to its **Diskit 2000** disk-structuring utility that allows it to work transparently with such data base systems as Relational Technology, Inc.'s Ingres. Diskit 2000 costs from $500 to $3,000.

Software Techniques, 6600 Katella Ave., Cypress, Calif. 90630. 714-895-1633.

Development tools

Application Development Systems, Inc. has announced **Xpediter/CICS 2.0**, an enhanced version of its interactive Cobol testing and debugging software package for IBM mainframes running CICS under MVS.

Release 2.0 supports IBM MVS/XA, VS Cobol II and DB2 and features two-terminal testing, the ability to display the source code with or without the command language translator-generated statements and an enhanced VSAM log file.

Xpediter/CICS 2.0 is priced at $19,000.

Application Development Systems, 6840 78th Ave. N., Minneapolis, Minn. 55445. 612-560-8633.

Metier Management Systems has ported its **Artemis** project management software to the U.S. Army's Unisys Corp. 5000/80 computers under the Unix operating system.

Called Artemis 7000U, the fourth-generation language was designed for project management application building. Based on a relational data base with an integrated network and scheduling system, it features a menu-driven, window-based command language.

The Unix verison of the Artemis applications, called Artemis Project, is a project management application written in Artemis 7000U. It features window-based network editing, pull-down menus, pop-up windows, multiple calendars, a custom report generator and full critical path capabilities.

Artemis Project on the Unisys 5000/80 costs from $40,000. Artemis 7000U costs from $90,000.

Metier Management Systems, Suite 1300, 2900 North Loop W., Houston, Texas 77092. 713-956-7511

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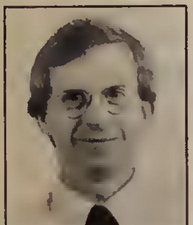


Who says MIS doesn't care about PCs? The number of companies planning to purchase IBM Personal System/2s and Intel 80386-based machines during the next 12 months will rise 27%, according to recent survey of *Computerworld* subscribers.

The survey also showed that more than one-third of all respondents work at organizations that currently have more than 100 micros, with the average number being 395.

The IBM Personal Computer architecture still dominates the corporate landscape, according to the survey, as four out of five subscribers work in a company using a PC, PC XT or AT.

The most popular add-in boards among subscribers were memory boards, at 84%, followed by graphics boards, at 81%, modem boards, at 71%, and terminal emulation boards, at 63%. Nearly all the respondents — 93% — recommended and/or purchased add-in boards of some kind, with the average company spending $25,000 for them.

Continued on page 56

Mac Plus price cut

Change moves machine well below SE range

BY JULIE PITTA
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. last week reduced the price of its Macintosh Plus microcomputer to $1,799 from $2,199.

The price reduction better positions the low-end system for the home and small business markets, according to Apple officials.

The reduction is "long overdue" and better reflects the Mac Plus's street price, according to Dataquest, Inc. analyst Sharon Hashimoto. An average Macintosh Plus sells for as little as $1,299 with dealer reductions, she added.

"The price was getting too close to the SE's," Hashimoto explained, noting that an entry-level Macintosh SE with a single floppy disk drive carries a list price of $2,799 and that a hard-drive version costs $3,599. She added, "The reason it probably took them so long is that if it was selling [so well], why reduce it?"

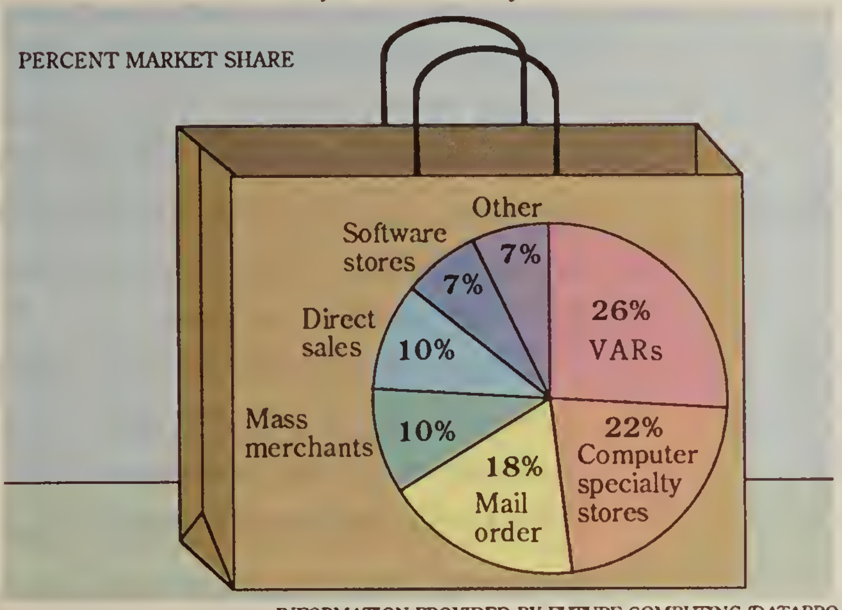
The price of the Mac Plus remained unchanged despite Apple's introduction of new systems. In April 1987, Apple introduced the Macintosh SE and the Motorola, Inc. 68020-

Continued on page 49

Data View

Where do you shop?

Value-added resellers handled most of the $7.6 billion worth of PC software sold last year



INFORMATION PROVIDED BY FUTURE COMPUTING/DATAPRO
CW CHART: AMY J. SWANSON

Vortex recovery system takes no time-outs

BY DOUGLAS BARNEY
CW STAFF

PITTSBURGH — Your computer will soon be able to go back in time with the help of the Vortex VAS 1000 from Vortex Systems, Inc.

Unlike most data recovery and backup systems, which capture data at set periods of time, the VAS 1000 captures all information generated from a personal computer and stores it on an 800M-byte optical disk drive from Maxtor Corp. The result is that users can go back to the computer's exact state before a keyboard error or data loss occurs.

"It is a time machine that is recording at all times anything written into memory or saved. It gives you a permanent audit trail," explained Kathleen Kato, controller for Vortex. The VAS 1000 reportedly will ship in May. The price has not been set but will be a high-end price, Kato said.

The product may be especially handy as microcomputers take on more host-style applications, in which data loss can be a disaster. It is also aimed at applica-

Continued on page 50

GEM revamp adds menus, VGA support

BY ALAN J. RYAN
CW STAFF

MONTEREY, Calif. — Digital Research, Inc. recently announced the latest release of its GEM operating environment software; the new version includes three modes of menu operation, support for the Video Graphics Array of IBM's Personal System/2 and enhanced laser printer support.

GEM/3, a graphical interface extension to IBM's PC-DOS, Microsoft Corp.'s MS-DOS, DOS Plus and Concurrent DOS, is packaged with GEM Desktop Publisher, GEM Draw Plus, GEM Graph, GEM Wordchart and GEM Presentation Team.

The operating environment has been largely used for graphics and desktop publishing applications such as Xerox Corp.'s Ventura Publisher but has been overshadowed by Microsoft's still-struggling Windows.

Continued on page 50

Inside

- Lotus's Silverado leads off CW's new Product Review section. Page 35.
- Arche adds 386-based system. Page 39.
- Mitac plans what it says will be the first PS/2 compatible. Page 49.

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REVIEWS/NEW PRODUCTS

Silverado data base is mother lode for 1-2-3

BY JIM TOOLE
SPECIAL TO CW

Silverado, a Lotus Development Corp. 1-2-3 add-in from Computer Associates International, Inc., gives 1-2-3 the capacity, query options and reporting flexibility of a full-fledged data base — all in the comfortable familiarity of the 1-2-3 spreadsheet.

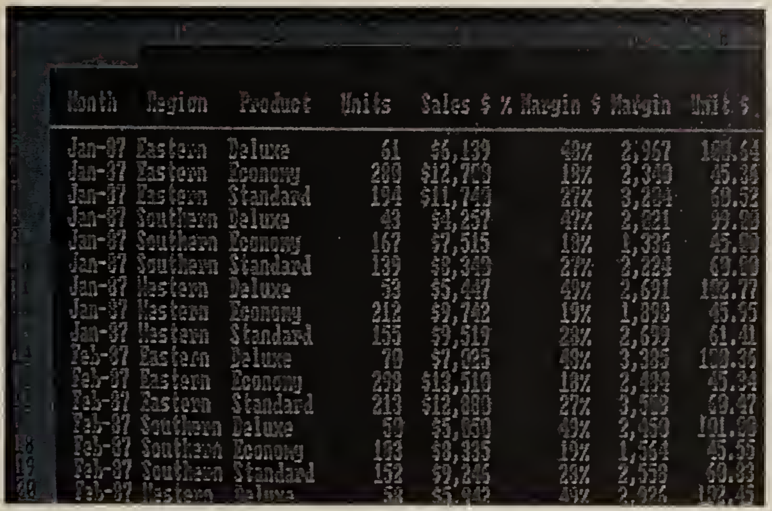
Consider this: You are working on a project analyzing earnings and time records for employees. You normally work with 1-2-3 and feel comfortable with its operation. But the data base on this project is 9,000 records long and includes the details of each employee's pay and hours by job category and pay period. Although 1-2-3 has the calculation capabilities you need, it cannot support this job's volume and reporting requirements. Must you now learn a data base package? Maybe not.

Features: Silverado is disk-based, so size is limited only by the capacity of the disk. You can create data bases that are dependent or completely independent of any existing spreadsheet. You can also import data from existing spreadsheets or from Ashton-Tate Corp. Dbase files. As another option, you can link a spreadsheet and a data base so that the spreadsheet is updated instantly for changes made to the data base.

Silverado takes advantage of 1-2-3's capabilities to enhance its data base. A data base can use the spreadsheet's data, and Lotus macros are used to control Silverado's operation. There is even a function that lets you use any 1-2-3 function not directly supported in Silverado.

Additionally, Silverado gives 1-2-3 some relational operations, including joining data from two data bases to create a third data base. Two other significant features are Silverado's "out liner," which shows output at any level of detail, and Form view, which lets the user look at the data base one record at a time.

A Silverado record can have up to 512 fields, 160 characters per label field and up to 79 characters for a field name.



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Month  Region   Product  Units  Sales $ % Margin $ Margin Unit $
Jan-87 Eastern  Deluxe      61   $6,139       48%   2,967  100.64
Jan-87 Eastern  Economy    280  $12,709       18%   2,349   45.39
Jan-87 Eastern  Standard   194  $11,743       27%   3,204   60.52
Jan-87 Southern Deluxe      43   $4,257       47%   2,021   99.00
Jan-87 Southern Economy    167   $7,515       18%   1,336   45.00
Jan-87 Southern Standard   139   $8,349       27%   2,224   60.06
Jan-87 Western  Deluxe      53   $5,447       49%   2,691  102.77
Jan-87 Western  Economy    212   $9,742       19%   1,898   45.95
Jan-87 Western  Standard   155   $9,519       28%   2,699   61.41
Feb-87 Eastern  Deluxe      70   $7,025       48%   3,385  100.36
Feb-87 Eastern  Economy    298  $13,510       18%   2,434   45.34
Feb-87 Eastern  Standard   213  $12,880       27%   3,5[illegible]   60.47
Feb-87 Southern Deluxe      59   $5,959       49%   2,450  101.00
Feb-87 Southern Economy    183   $8,335       19%   1,564   45.55
Feb-87 Southern Standard   152   $9,246       28%   2,558   60.83
Feb-87 Western  Deluxe      58   $5,942       49%   2,926  102.45
```

Silverado offers *data base capabilites to 1-2-3 users*

Silverado
Price:$149
• Performance: Very good • Documentation: Very good • Ease of learning: Very good • Ease of use: Very good • Error handling: Excellent • Support: Poor • Value: Excellent

Performance: Very good. Although Silverado is no speed demon, we were impressed with its power and its ability to select and report data.

We tested the program's capabilities by converting a business payroll file from 1-2-3. Using the built-in reporting features, we were able to almost instantly generate the W-2 information by employee for the year. With the same earnings record data base, we were able to get summary reports or detail reports by employee by pressing one key each.

Documentation: Very good. Silverado comes with a manual that includes a well-written tutorial and a glossary of terms. The indexes and table of contents are thorough.

Ease of learning: Very good. Silverado's data base operation is actually easier to learn than 1-2-3's. All requirements are selected through menu choices and screen prompts, and context-sensitive Help is always just a keystroke away.

Ease of use: Very good. Silverado makes use of the same interface as 1-2-3 and Lotus macros. For the experienced Lotus user with some data base experience, Silverado is extremely easy to pick up and to use.

Error handling: Excellent. Silverado has extensive error messages, prompts and even a file-recovery option in the menu. The manual includes a section describing the messages, possible causes and remedies.

Support: Poor. Silverado is not copy-protected, and there is no guarantee beyond the media warranty. Telephone support is offered for six months but is not toll-free. Extended support costs $75 a year, allowing unlimited calls to an 800 number.

You must register to get support; the technical staff calls after your registration is completed. We waited 24 hours for a callback.

Value: Excellent. If you use the data base functions in 1-2-3 or use a separate data base because of 1-2-3's limits in capacity or reporting capabilities, you will love Silverado. This package is easy to learn and use and appears to have great depth.

Toole is a CPA and a principal in a training firm in Washington.

Note on reviews

The reviews presented in this section are encapsulated versions of reviews published recently in Infoworld, *an International Data Group publication. The text is transmitted by the IDG News Service and edited by Suzanne Weixel, a Framingham, Mass.-based freelance writer.*

Surpass gives Lotus users easy option

BY JOHN WALKENBACH
SPECIAL TO CW

Surpass Software Systems, Inc. offers Surpass as yet another choice in the newest crop of spreadsheets designed to overcome some of the limitations of Lotus Development Corp.'s 1-2-3. Like Borland International's Quattro and Paperback Software International's VP-Planner Plus, Surpass makes it very easy for 1-2-3 users to make the switch.

Features: Surpass has a visual file manager that you can pop up to select the file or files you will be working with. You can work with up to 32 spreadsheets simultaneously, and you can move and resize the spreadsheet windows at will — just as you can with Microsoft Corp.'s PC Excel.

Surpass not only features a command interface that is practically identical to 1-2-3's, but it also features many of the advanced capabilities of Excel. These include simplified spreadsheet linking, background recalculation, minimal recalculation and an UNDO command.

Surpass
Price:$495
• Performance: Very good to excellent • Documentation: Good • Ease of learning: Satisfactory • Ease of use: Very good • Error handling: Satisfactory • Support: Very good • Value: Very good

The UNDO command reverses your most recent action, including accidental deletions. It can also be used for "what-if" operations and for toggling back and forth between your original numbers and modified results.

You can set the width of multiple columns with a single command and adjust each column width in a specified range automatically.

Lacking in Surpass are such niceties as spreadsheet auditing, goal seeking, user-defined functions and cell notation.

Performance: Very good to excellent. Our benchmark timing tests show Surpass's Version 1.0 to be comparable to 1-2-3. It also performs well in our minimal recalc timing tests, showing improvement relative

Continued on page 38

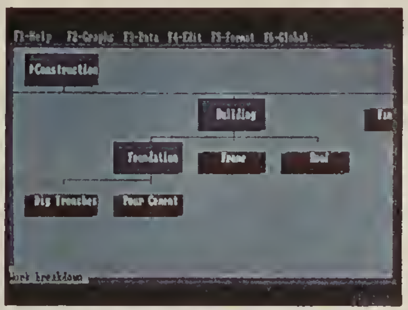
Total Project Manager takes on big work load

BY VERN MILLER
SPECIAL TO CW

Harvard Total Project Manager (TPM) II, from Software Publishing Corp., was one of the first project management packages to offer cross-project resource allocation, a feature that allows you to track workers assigned to multiple projects. Enhancements in Version 2.01 allow the program to handle an essentially unlimited load by using nested subprojects.

Features: Harvard TPM II 2.01 lets you set up a project four ways: Program Evaluation and Review Technique, or PERT, chart, which links boxes representing tasks to show the work structure; Gantt chart, which lists tasks in a column and draws lines across a calendar to show the use of time; task lists; and the Work Breakdown method, which lets you start with the goal of the project and break it into component subactivities.

Harvard TPM II 2.01 also lets you split off groups of tasks into subprojects, each with a schedule file linked to the main project. This makes the project capacity subject only to disk drive capacity.



Harvard TPM II 2.01 *makes the grade*

You can schedule forward or backward according to either task duration or resource constraints.

Harvard TPM II Version 2.01
Price:$595
• Performance: Good • Documentation: Very good • Ease of learning: Very good • Ease of use: Excellent • Error handling: Very good • Support: Good • Value: Good

Harvard TPM II 2.01's standard PERT display shows up to 20 tasks. The Gantt display shows only four to eight tasks at once. The program's limited zoom capability does not show task details for PERT or Gantt charts; however, a split screen does display the project in two forms.

Performance: Good. We ran Harvard TPM II 2.01 on an 8-MHz Intel Corp. 80286-based machine with a hard disk. We designed a project with two subprojects and a combined total of 50 tasks. In the areas of adding, changing and deleting tasks, Harvard TPM 2.01 offers a lot of functionality and power at a reasonable speed.

Recalculating the critical path typically took about 14 seconds. The vendor attributed the relatively slow recalculation to Harvard TPM's complex cross-project resource allocation.

Documentation: Very good. Documentation is thorough and well written. Installa-

Continued on page 38

MIS manager buys

Macintosh, keeps job.

Until very recently, the above headline was the MIS equivalent of "Man Bites Dog."

Because specifying Macintosh® personal computers for the corporate desktop was an act of sheer daring. Like hang gliding, or wearing a Mohawk.

But now, if the behavior of data processing executives is any indication, we've engineered the thrills out of handing us a purchase order.

Since the introduction of the Macintosh Plus with its 1 to 4 megabytes, and most recently the faster, expandable and MS-DOS compatible SE, hundreds of the *Fortune 500* have put Macintosh to work.

At first we were hired for specific jobs that no one else can do as well. Like low cost CAD/CAM and Desktop Publishing.

But then, our other merits revealed themselves.

Such as the open architecture of the SE and the new Macintosh II.

Which lets you connect seamlessly to DEC's VAX, IBM mainframes, and other popular systems. And by putting Macintosh at the front end, you give people a more civilized way to deal with mainframes.

Another revelation is the wide array of innovative Macintosh business applications–financial analysis, word processing, databases, and, of course, graphics. Which are not only easier to learn than what's running elsewhere, but more advanced.

The point-and-click simplicity of the Macintosh graphic interface is a well known boon for the user.

But it also turns out to be a major time and money saver for you who have to train all those users. Because Macintosh has a lower training cost per desktop than any MS-DOS computer on the market.

Macintosh's simple, straightforward operating style also pays off impressively after the training is over.

In an in-depth analysis of 7 Macintosh installations in business, users consistently reported productivity gains of 15 to 25% and more.

And on top of all this, Macintosh has excellent connections.

While others are pushing the "network of the Near Future," the Macintosh network is here and now. It's called AppleTalk®.

AppleTalk is a networking protocol that is at the same time sophisticated, infinitely flexible, easy to set up. And meets ISO standards.

You can link the system together just about any way you want to–over phone lines, twisted pair, fiber optics or Ethernet.

Plug in a card and you can run AT&T UNIX® as well as MS-DOS applications. And in fact, there are a variety of other ways to integrate Macintosh into the MS-DOS world.

Including the AppleShare™ file server which lets Macintosh and PC's link and share data.

All of which makes it a simple matter to incorporate Macintosh into any existing network.

Or, to build new ones.

We'd like an opportunity to demonstrate these and a catalogue of other innovations.

Just call your Apple Sales Representative. Or call us directly at 800-446-3000, ext. 400 for the name of the authorized Apple reseller nearest you.

You'll find out how so many DP professionals can buy Macintosh.

And still keep their names out of the papers.

The power to be your best.™

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Total Project

FROM PAGE 35

tion is covered clearly, and a brief Tour Guide provides the basic techniques and commands.

Ease of learning: Very good. The self-paced, on-line tutorial provides a quick way to learn all aspects of the program except report generation. The on-line Help and easy menu structure help get you up and running in no time.

Ease of use: Excellent. Harvard TPM II 2.01's clean user interface makes building a project schedule a logical and fast-flowing procedure. Within minutes, we were comfortable navigating the pull-down menus and switching among PERT, Gantt and tabular displays.

Error handling: Very good. We tried to crash the program by entering invalid data in parameter fields. This generated error messages that spelled out options for making corrections. The error messages require a response that, although annoying, discourages hasty mistakes.

One problem we encountered was that we made an error setting up the Gantt time scale and the program would not accept it. We would have liked an automated method for fixing it.

Support: Good. Harvard TPM II 2.01 is not copy-protected, and no warranty is offered. Non-toll-free support is available from 8 a.m. to 4 p.m. Pacific Standard Time.

Value: Good. Harvard TPM II 2.01 offers all the functionality of other full-featured project management packages and more flexibility than most. It is priced in the middle of its market, and though the competition is strong, the program's flexible setup, easy task input and editing of task and resource definitions are a valuable bonus.

Miller has 15 years' experience in managing project development for minicomputer products.

Surpass

FROM PAGE 35

to unadorned 1-2-3. Surpass successfully completes our 1-2-3 compatibility test, including the flawless importation and execution of a feast of macros. It also improves on the graphics capability of 1-2-3. Surpass's graphs are easily on par with Quattro's. The data base features of Surpass are identical to 1-2-3's.

Documentation: Good. The documentation for Surpass is contained in a loose-leaf binder; a 20-page quick-reference guide gives you access to functions, special keys and macro commands. The manual itself is comprehensive, but we would like to see more diagrams and sample screen shots.

Ease of learning: Satisfactory. The package includes a 70-page tutorial in the manual for users who are familiar with spreadsheets. There is no on-line tutorial.

Ease of use: Very good. Some of the additional features in Surpass give it an edge over 1-2-3 in ease of use. However, the drop-down menus do not include a one-line description of each command, nor do they work as intuitively as we would expect.

Error handling: Satisfactory. The UNDO feature is great, assuming you remember it is there. In other areas, Surpass appears to be bulletproof, but there are a few deficiencies related to error messages.

Support: Very good. A toll-free sales number is also accessible for technical support.

Support is available from 9 a.m. to 6 p.m. Pacific time. Our two calls were answered promptly, and both times we were connected to a knowledgeable support representative.

Value: Very good. Surpass is priced identically to 1-2-3 and Excel but is significantly more expensive than VP-Planner Plus and Quattro. Given its performance and flexibility, we think it represents a very good value.

Note: Surpass Software recently updated Surpass to correct minor bugs and improve performance and printing. The new features had not been tested at the time of this review.

Walkenbach is consumer research manager for a leading savings and loan association in Southern California.

You won't get much glory without power.
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Because LIfE works

LIfE

Power Is The Re

NEW PRODUCTS

Systems

An Intel Corp. 80386-based personal computer has been introduced by **Arche Technologies, Inc.**

Called the **Arche Rival 386,** the switch-selectable 10- or 20-MHz computer offers 2M bytes of memory expandable to 16M bytes of 32-bit, zero-wait state interleaved memory. Features include a 1.2M-byte 5¼-in. floppy disk drive and optional 40M-, 65M-, 80M- and 140M-byte fixed disk drives. It can accommodate up to three half-height storage devices internally.

Also standard is a 101-key keyboard, two parallel and two serial ports, eight expansion slots and a 14-in. monochrome amber monitor.

The Microsoft Corp. MS-DOS 3.3-based system is priced from $4,395.

Arche Technologies, 48835 Kato Road, Fremont, Calif. 94539. 415-683-6758.

An enhanced version of the **Computereyes** video digitizer has been announced by **Digital Vision, Inc.**

Computereyes now offers support for the graphics capabilities of Hercules Computer Technology, Inc. cards as well as IBM's Enhanced Graphics Adapter and Video Graphics Array (VGA). VGA images are displayed in up to 64 shades of gray.

Captured images may be saved to disk in a variety of formats independent of the computer's display capabilities. Formats include .PCX, TIFF, .IMG and Microsoft Corp.'s Windows.

Computereyes is priced at $249.95.

Digital Vision, 66 Eastern Ave., Dedham, Mass. 02026. 617-329-5400.

A transputer board featuring four 20-MHz, 32-bit Inmos T800 chips and 4M to 16M bytes of random-access memory has been introduced by **Microway.**

Called **Quadputer,** the board operates on Intel Corp. 80386-based computers as well as on IBM Personal Computer XTs and PC ATs.

Quadputer is priced from $8,000 with 4M bytes of 100-nsec RAM to $13,600 with 16M bytes of 100-nsec RAM. Fortran, C, Pascal and Prolog compilers cost $750 each. Transputer Development System software costs $1,500.

Microway, P.O. Box 79, Kingston, Mass. 02364. 617-746-7341.

Zenith Data Systems has doubled its **Z-386** personal computer's standard random-access memory to 2M bytes.

The **Model 40 Z-386** features a 40M-byte hard disk drive, a 1.2M-byte floppy disk drive and four open expansion slots. The **Model 80 Z-386** features an 80M-byte hard disk drive. Zenith bundles Microsoft Corp.'s Windows/386 and MS-DOS 3.21 with all Z-386s. Microsoft's MS OS/2 is also available for the Z-386.

The Model 40 costs $6,499. The Model 80 costs $7,499.

Zenith Data Systems, 100 Milwaukee Ave., Glenview, Ill. 60025. 312-699-4839.

the way workgroups do. Dynamically. Interactively. Cooperatively. And it has all the tools they need to reach their full potential—novices and power-users alike.

For instance, LIfE•Forms. A high-performance procedure automation tool that works like the business forms you already use. But LIfE's forms are intelligent, with commands and instructions built into them. Like formulas in a spreadsheet. Which gives your workgroup the power to develop many of its own applications.

LIfE•Plans. A true multi-user spreadsheet. Easy as 1-2-3.® But powerful enough to juggle a dozen databases simultaneously. Anywhere in the network. In mainframes, minis, LANs or PCs.

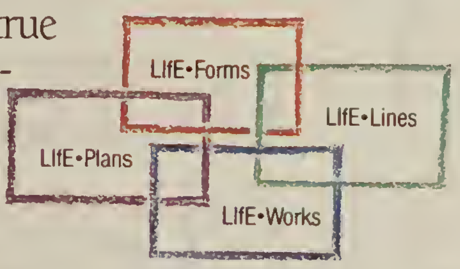
LIfE•Lines. A high-velocity electronic mail module that accelerates communications within your workgroup. And with other workgroups, wherever they may be.

LIfE•Works. A data-entry module powerful enough to make most dedicated transaction-processing systems blush.

And it all runs on some of the hottest hardware around. A multi-user supermicro built around today's most powerful microprocessors—the Motorola 68000 family. With an open architecture that lets your power-users enjoy LIfE wherever they want. On whatever they want—from laptops to mainframe terminals.

For a look at LIfE in real life, call 800-556-1234, Ext. 165. In California, 800-441-2345, Ext. 165.

And more power to you.



LIfE is a powerful group of integrated applications that work together the same way workgroups do—dynamically, interactively and cooperatively

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Software applications packages

MGI/CADD 3, a dual-module two-dimensional computer-aided design (CAD) program for IBM Personal Computers, has been announced by **Microcomputer Graphics, Inc.**

The schematic drawing module uses cell-size symbols that automatically snap together on the screen. Eight schematic libraries are included and customization is supported.

Features of the mechanical and architectural drafting module include creation of fillet variations with single keystrokes and previewing of tangent combinations prior to execution.

Features of both modules include block functions; a mirror function; scrolling; zoom; snap; break and trim operations; cross-hatching and regular polygons; and layered drawings differentiated by color.

MGI/CADD 3 costs $1,495.

Microcomputer Graphics, 13468 Washington Blvd., Marina Del Rey, Calif. 90292. 213-822-5258.

Software designed for use in preparing federal income tax returns has been announced by **Legal Knowledge Systems, Inc.**

Called **Ask Dan About Your Taxes**, the software is said to prepare the Form 1040 and related forms and schedules. It uses its knowledge of the new tax law to lead the user through question and answer sessions, resulting in customized returns.

Features include spreadsheet style recomputation, on-screen tax forms, printing, pop-up scratch pads and a menu-driven interface. According to the vendor, the program can accommodate up to 10 partnerships or businesses with a total of 10 depreciation schedules.

The software costs $69.95.

Legal Knowledge Systems, 195 Maplewood St., Watertown, Mass. 02172. 617-923-2322.

Orion Micro Systems, Inc. has enhanced is **FDC/Pyramid** personal computer-based system for collection, consolidation and reporting of business data.

FDC/Pyramid can transmit corporate data over worldwide networks. Reporting requirements are translated into PC-based forms that are then distributed to the remote reporting locations. Cross-checks and downchecks automatically validate the data according to the corporation's rules. Files are transmitted to the corporate office where the data is consolidated.

The software includes currency conversions, multistructure consolidations, adjustments and automatic eliminations for such items as intercompany transactions. Files can be exchanged with Lotus Development Corp.'s 1-2-3.

Pricing starts at $25,000.

Orion, Croft Commons, 95 Scovill St., Waterbury, Conn. 06702. 203-753-1086.

Wingraph, which is a business graphics program that runs in the Microsoft Corp. Windows environment, was recently announced by **Palantir**.

Wingraph is said to automatically generate charts and graphs from numerical data. Chart styles such as bar, stacked bar, staggered bar, three-dimensional bar, line, line fill, curved line, pie, marker and high/low are included. Wingraph accepts DIF, WKS and ASCII files and writes TIFF, CITY, DXF and HPGL files.

Other features include a slide show program that permits images to be displayed in sequence and the ability to customize style sheets.

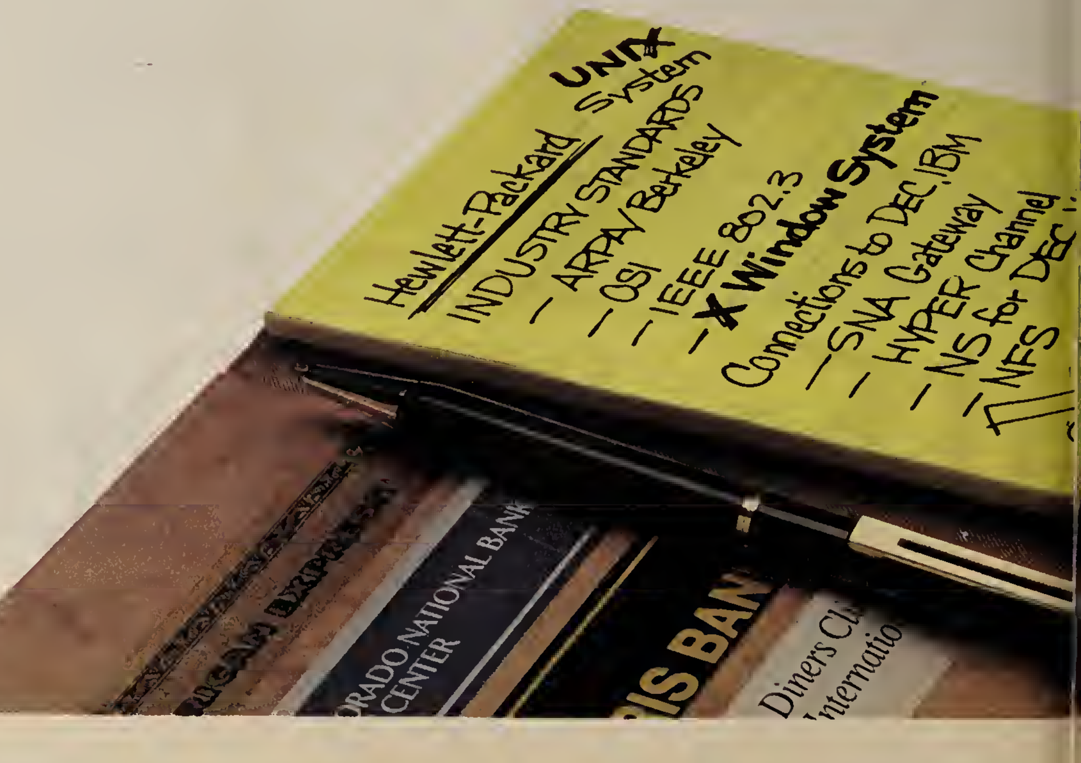
Wingraph is part of Palantir's Windows Office Automation Series. The product carries a price of $195.

Palantir, Suite 100, 12777 Jones Road, Houston, Texas 77070. 713-955-8880.

A general-purpose office organizer for use on personal computers has been announced by **Occhipinti Technologies, Inc.**

Executive Assistant features integrated office functions, word processing and automatic telephone dialing. It can be used in single- or multiuser environments.

The software can run stand-



Plain talk on why more and more workstation buyers are turning to HP.

They're turning for good reason.

HP offers more capability in workstations than ever before.

Namely, an entire family of high-performance workstations that thrive in multivendor environments. They support industry standards in networking, graphics, the UNIX operating system, the X Window System, and a variety of languages.

It means this. HP workstations fit your computing environment. And grow with you instead of growing obsolete.

Need applications software? No problem. You have your choice of world-class HP solutions in CAE/CAD, microprocessor development, PCB test, and more. For special applications, we offer over 1,000 software

Brake assembly data courtesy of SDRC
Automobile data courtesy of Chrysler Motors

UNIX is a registered trademark of AT&T in the U.S. and other countries
HYPERchannel is a trademark of Network Systems Corp
NFS is a trademark of Sun Microsystems

alone or in memory-resident mode.

In memory-resident mode, certain functions can be used through third-party applications such as spreadsheets and word processors.

Executive Assistant costs $129.

Occhipinti Technologies, 1253 Orion Ave., Metairie, La. 70005. 504-834-0248.

A word processor with desktop publishing capabilities has been introduced by **Lifetree Software, Inc.**

Called **Total Word**, the software is said to offer the ability to capture any graphic, regardless of source, and more than 400 scientific and technical symbols with laser printer support.

Word processing features include on-screen editing and context-sensitive Help as well as the ability to share a document electronically. Also included are automatic index, outline, footnote and table of contents generation; a 300,000 word thesaurus and a 170,000 spelling dictionary; a style sheet; text merge; and fill-in-the-blank capabilities.

Total Word runs on IBM Personal Computers and Personal System/2s. It costs $495.

Lifetree Software, 411 Pacific St., Monterey, Calif. 93940. 408-373-4718.

AR/Net, a fully functional version of the Adaptive Resonance Network, a neural network architecture for unsupervised recognition and classification of arbitrary patterns, has been announced by **Hecht-Nielsen Neurocomputer Corp.**

When used with the vendor's Anza Neurocomputing Coprocessor System on an IBM Personal Computer AT or compatible, AR/Net enables the user to construct a self-programming system that can create and organize its own categories from patterns presented to it. The user can also call the Adaptive Resonance Network as a subroutine from within programs written in C.

AR/Net is priced at $495 if purchased with an Anza system or $600 if purchased separately.

Hecht-Nielsen, 5893 Oberlin Drive, San Diego, Calif. 92121. 619-546-8877.

Software utilities

Datability Software Systems, Inc. has announced a personal computer software package that reportedly allows PC printers to be configured as Digital Equipment Corp. VAX/VMS system printers as if connected through a DEC terminal server.

The **RAF Print Server** is implemented as 5K bytes of memory-resident software on the PC. Once it is installed, a VAX system manager can define a VAX print queue that automatically prints on a PC-based printer.

The RAF Print Server costs $495 for each PC.

Datability Software, 322 Eighth Ave., New York, N.Y. 10001. 212-807-7800.

A compiler designed for Ashton-Tate Corp. Dbase-type programs has been announced by **Sophco, Inc.**

Called **Force III**, the compiler is said to support such Ashton-Tate Dbase III Plus features as full-screen editing commands. According to the vendor, output is stand-alone and can be linked through Tlink or Plink.

In addition to supporting standard Dbase commands, Force III features user-defined functions, arrays, extended math functions, extended character functions, I/O directive capability, file primitives and numeric data types. It is also said to automatically take advantage of on-board math coprocessors when present.

The Force III compiler costs $129.

Sophco, P.O. Box 7430, Boulder, Colo. 80306. 303-444-1542.

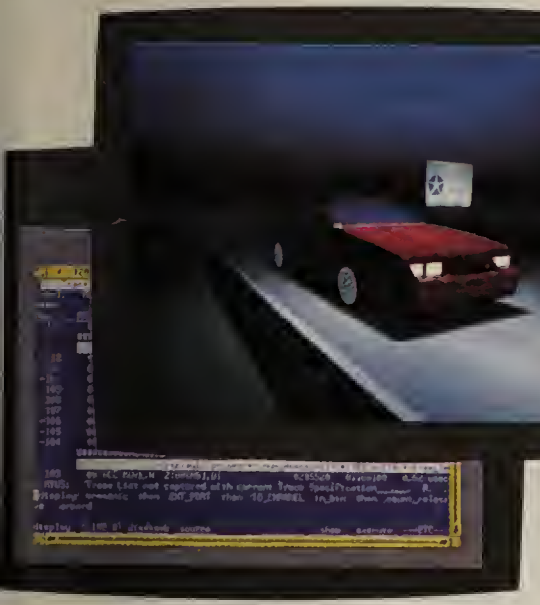
A software utility designed to predict the amount of software that must be written for a particular application has been announced by **Quantitative Software Management, Inc.**

The software, called **Size Planner**, is said to combine estimates from fuzzy logic, function points, standard components and new, modified and

Continued on page 42

packages from our third parties. So either way, you're covered.

Our new family of 32-bit machines is complete, and gives excellent value from low end to high. Which means you can choose the right workstation, while getting the most from your investment. Our Model 318M, starting at $4,990, sets new standards in entry-level price/performance. And the Models 330, 350, and 825 provide the power for your toughest technical applications.



Want extraordinary speed and resolution in 2D and 3D graphics? You'll find it on our entire family. One good example: the new Model 825SRX Precision Architecture Superworkstation. It combines 8 MIP computation power with interactive solid rendering graphics.

Something else you should know. The HP family is modular. And works with an extensive line of HP input and storage devices, monitors, printers, and plotters. So you can get a complete system, supported as a system, from one source.

Speaking of the source, HP delivers unsurpassed service and support, with a proven reputation for minimizing your overall cost of ownership.

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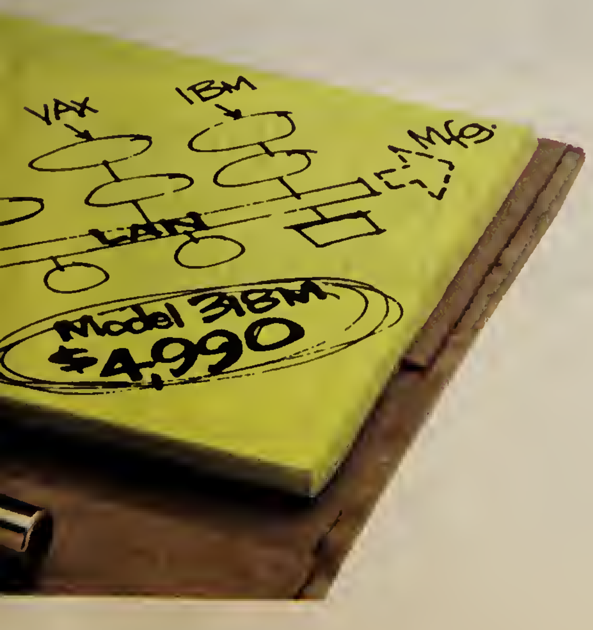

HEWLETT PACKARD

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Continued from page 41

reused code techniques to reduce the uncertainty in the prediction. It also includes a module-to-record sizing history.

Size Planner can be leased annually for $9,500.

Quantitative Software Management, 1057 Waverly Way, McLean, Va. 22101. 703-790-0055.

Software said to encrypt and decrypt files on IBM Personal Computers, PC XTs, ATs and compatibles has been announced by **Digitech Telecommunications, Inc.**

Called **Code Name: Password**, the software is said to prevent unauthorized access to the hard disk drive. It uses the National Bureau of Standards' Data Encryption Standard and allows users to select Define Function keys. Up to 4,000 bits of information can be encrypted or decrypted per second.

Other features include multiple levels of encryption, password protection and the ability to completely erase a file on command.

Code Name: Password costs $99.

Digitech Telecommunications, Suite 210, 342 Madison Ave., New York, N.Y. 10173. 212-557-7230.

Matrixplotter, a software utility that can be used to rasterize graphic images and format them for output on dot matrix printers, has been announced by **Insight Development Corp.**

The random-access memory-resident utility works with any Microsoft Corp. MS-DOS-based Hewlett-Packard Co. HPGL-compatible software. It outputs to Epson America, Inc.- and Toshiba America, Inc.-compatible matrix printers. It converts the drawing vectors used by plotters into the raster-oriented bit-mapped images required by the dot matrix printer. The image is printed at the full resolution of the printer.

Features include a Lotus Development Corp.-style interface, user-selectable line widths and pen sizes and gray scale capabilities.

Matrixplotter costs $99.

Insight Development, Suite 104, 1024 Country Club Drive, Moraga, Calif. 94556. 415-376-9451.

A source code management system called **Advantage VCMS** has been announced by **Lifeboat Associates, Inc.**

According to the vendor, Advantage VCMS automates the process of source code management using such functions as a Make utility, a full-screen interface, the ability to compress data on archive files and a report generator. Report contents can be user-defined, the vendor said, and audit trail reports containing all the information archived can be generated.

Advantage VCMS runs on IBM Personal Computers and compatibles under Microsoft Corp. MS-DOS 2.0 or higher. It costs $379.

Lifeboat Associates, 55 S. Broadway, Tarrytown, N.Y. 10591. 914-332-1875.

California Software Products, Inc. has upgraded its **California 10 Pak** programmer's tools and **Helpme** diagnostic utility for use with IBM and Microsoft's OS/2 on IBM's Personal System/2.

California 10 Pak contains programs for browsing, comparing and sorting the contents of files and memory.

According to the vendor, the tools identify the system's configuration and current state, including a description of the installed video display adapter and its current settings.

Helpme is a set of diagnostic tests for personal computers and local-area networks.

It identifies common problems involving installation and performance, including deviations from IBM standards.

The California 10 Pak costs $79. Helpme costs $99.

California Software Products, 525 N. Cabrillo Park Drive, Santa Ana, Calif. 92701. 714-973-0440.

PC Publishing, Inc. has added to its line of Lotus Development Corp. 1-2-3 add-in utilities.

Delta Manager is an uncertainty solver that allows users to introduce an uncertainty factor on specified cells in a work sheet. It costs $149.

Flash-In, priced at $79.95, provides search, replace and locate features. **Graph-Mania**, priced at $69.95, provides a set of screen management options.

4Base, priced at $149, provides a data base management program with import and export capabilities between 1-2-3 and Ashton-Tate Corp.'s Dbase III. It also has built-in index management and speed management features.

@Tools, priced at $295, is a program that allows users to develop customized @functions in C.

The company also announced **Version 3.0** of **Deja**, its $129.95 data transfer program, featuring index management.

PC Publishing, Suite 800, 1801 Avenue of the Stars, Los Angeles, Calif. 90067. 213-556-3630.

Development tools

Flexus International Corp. has announced a development tool that supports prototyping and user interface management for PC Cobol applications.

Cobol SpII allows users to build interactive models, which can then be converted into a Cobol program. The model can be created without writing any Cobol source code. It also provides two program implementation options for screen-handling logic; users can translate the components of the working model into native

How Customer Support Will Keep Pace with Tomorrow's Modem Technology

Created by Dayner/Hall, Inc., Winter Park, Florida

Cobol source code, or they can use a prewritten screen-handling subroutine that is linked to the application.

Also included is a panel painter, a panel file manager, a runtime unit and a source code generator.

Cobol SpII supports Micro Focus Ltd.'s Cobol/2; Realia, Inc.'s Realia; Ryan McFarland Corp.'s 74 and 85; and Microsoft Corp.'s Microsoft Cobol.

Cobol SpII costs $395.

Flexus, P.O. Box 9119, Morristown, N.J. 07960. 201-895-4724.

Q-N-E International has announced the **Prowindows** option for its Q-Pro-4 fourth-generation language and data base manager.

Prowindows allows a user to open up to 100 windows for each application. It has facilities that allow the creation of enterable windows, nonenterable dynamically modified windows and Help windows.

Windows can be any size and can be placed anywhere on the screen. Prowindows supports color and sound effects and is compatible with Novell, Inc. and IBM Personal Computer networks with file and record locking.

Prowindows costs $250.

Q-N-E International, 136 Granite Hill Court, Langhorne, Pa. 19047. 215-968-5966.

A development version of the **Knowledge Engineering Environment** (KEE) software system for Intel Corp. 80386-based personal computers has been announced by **Intellicorp.**

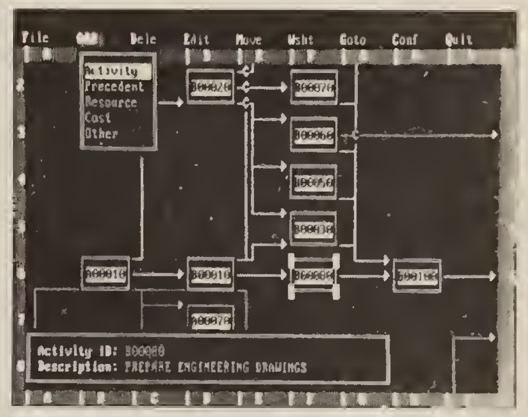
The product is a complete implementation of the KEE system. According to the vendor, KEE on 386-based systems is compatible with KEE on other hardware platforms.

Initially, the development version of KEE will run on Compaq Computer Corp.'s Deskpro 386 and Compaq Portable 386. It costs $15,000.

Intellicorp, 1975 El Camino Real W., Mountain View, Calif. 94040. 415-965-5500.

Software enhancements

Welcom Software Technology has added an interactive graphical program for entering project data to its **Open Plan** project management system.



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Description: PREPARE ENGINEERING DRAWINGS

Welcom's *Open Plan system*

The enhancement, called Project Worksheet, allows users to enter data in work sheet cells that appear on a spreadsheet format grid of lettered columns and numbered rows. Specific project activities are numbered and entered in boxes on the screen. Boxes are joined to other related boxes to form a logic diagram or project network. Up to 10,000 activities may be input with Project Management, the vendor said.

The user interface includes pull-down menus, pop-up windows and field-sensitive Help.

Open Plan 3.0 is written in Ashton-Tate Corp.'s Dbase III Plus. It costs $4,200.

Welcom Software Technology, Suite 125, 1325 S. Diary Ashford, Houston, Texas. 77077. 713-558-0514.

Version 2.0 of the instant graph generator **Graph-in-the-Box** has been announced by **New England Software, Inc.**

Enhancements include IBM Video Graphics Array compatibility, the ability to create Adobe Systems, Inc. Postscript files, full-page printouts, batch printing and the ability to create sequenced slide shows.

According to the vendor, Version 2.0 makes Graph-in-the-Box compatible with such Postscript-compatible software as Xerox Corp.'s Ventura Publisher.

Graph-in-the-Box Version 2.0 costs $99.95.

New England Software, Greenwich Office Park 3, Greenwich, Conn. 06831. 203-625-0062.

Systems Compatibility Corp. has enhanced its **Software Bridge** file conversion program for personal computer-based word processing packages

Enhancements include translation capabilities for Micropro International Corp.'s Wordstar 2000, Digital Communications Associates, Inc.'s DCA/FFT and DCA/TXT and Borland International, Inc.'s Sprint.

According to the vendor, files converted with Software Bridge maintain function and format codes, which are contained in the source document.

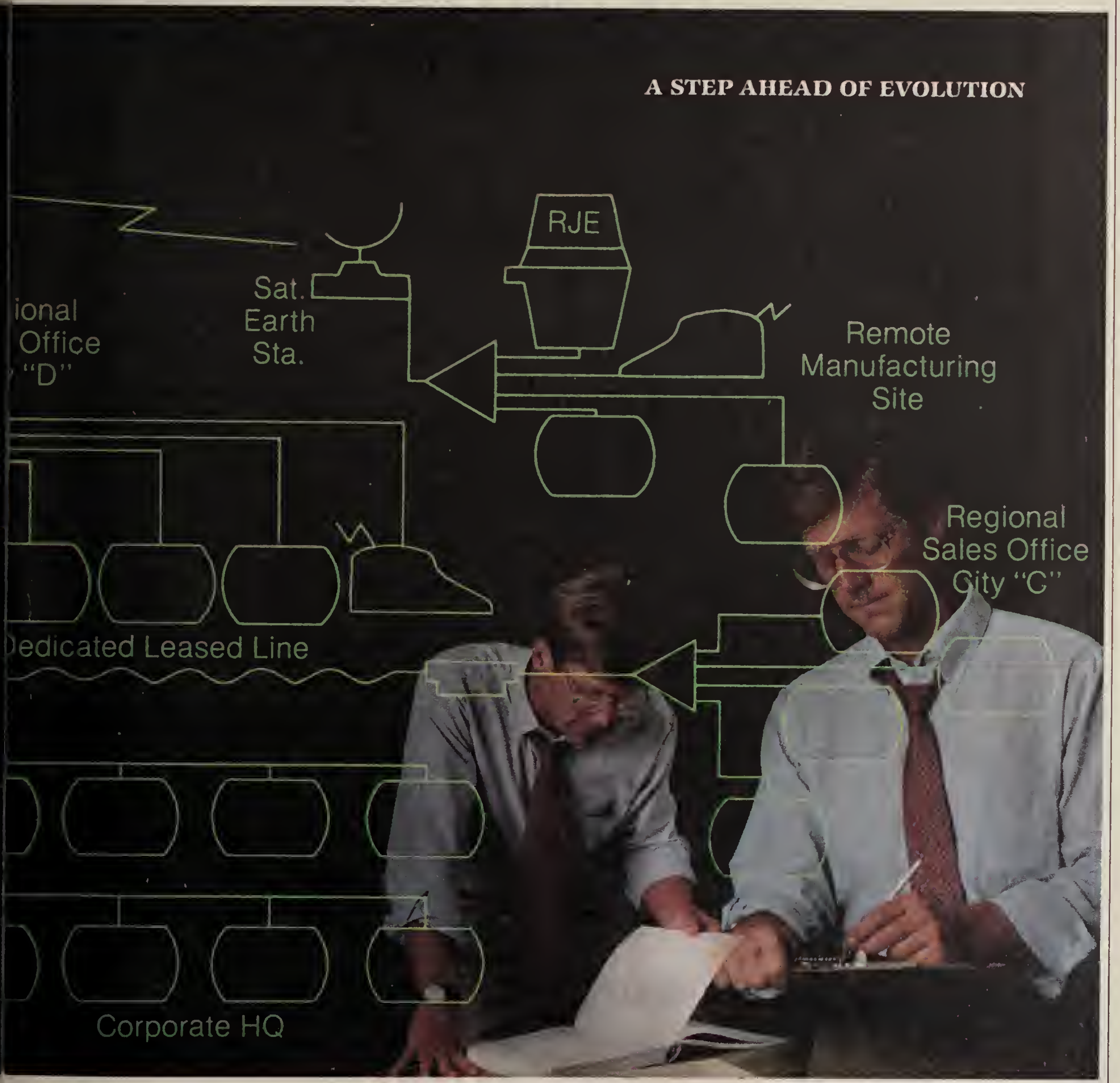
Software Bridge Version 3.0 is available on 5¼- or 3½-in diskettes for $149. Registered users may upgrade for $49.95.

Systems Compatibility, Suite 600, 401 N. Wabash, Chicago, Ill. 60611. 312-329-0700.

Key Systems, Inc. has released **Prospecting Plus**, an enhanced version of its Prospecting sales support software package for personal computers.

Enhancements include access to a file

Continued on page 44



Even as datacomm systems get more complex, users are becoming more dependent on them. That's a double whammy that makes customer support one of the hottest data communications topics of the day.

UDS is ahead of the game! A customer support "war room" at our Huntsville, AL, headquarters provides 60 hours per week of real-time troubleshooting assistance. Users dial in, and UDS technicians go on-line to the suspect equipment. About 90% of the calls result in on-the-spot solutions.

If growing datacomm dependence is dictating your design, integration or management decisions, you need the modem supplier who's a step ahead of evolution.

For specific product details, contact *Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 1-800-451-2369; Telex 752602 UDS HTV.*

Universal Data Systems
MOTOROLA INC.

Continued from page 43

by company name, contact name, telephone number or follow-up date; and pop-up scripting.

Prospecting Plus also includes the optional features of the previous package, such as a mail manager and an automatic telephone dialer.

Prospecting Plus costs $495 for the first installation and $198 for each add-on. A six-user local-area network or Unix multiuser system costs $1,485. Up to 75 users and 99,999 prospects can be supported on one system, the vendor said.

Key Systems, 512 Executive Park, Louisville, Ky. 40207. 502-897-3332.

An enhanced version of the **Backez** backup and restore utility for IBM Personal Computers has been announced by **EZ-Logic, Inc.**

Release 3.0 features a tape option said to incorporate popular tape devices into the device-independent storage management strategy. According to the vendor, the user will not be able to tell the difference between tape and disk media. A network option allows the user to back up and restore data across a local-area network or mainframe data link.

Other enhancements include on-line Help and the ability to manage data on any Microsoft Corp. MS-DOS-compatible device.

Backez Release 3.0 costs $99.

EZ-Logic, 315 S. El Monte, Los Altos, Calif. 94022. 415-949-2834.

Data storage

A solid-state, nonvolatile add-in memory board for microcomputers has been announced by **Magnesys.**

The **Drivecard** features 360K or 720K bytes of usable memory storage with a personal computer bus host adapter included on the master board. The master Drivecard can support up to six additional Drivecards or Magnesys's Electronic Drives, the vendor said.

The unit is compatible with IBM PC- and Microsoft Corp. MS-DOS Versions 2.0 through 3.2. It costs $1,195. Satellite boards cost $1,105.

Magnesys, 1605 Wyatt Drive, Santa Clara, Calif. 95054. 408-988-1881.

Cipher Data Products, Inc. has announced quarter-in. tape subsystems in 125M- and 150M-byte configurations for the IBM Personal Computer and Personal System/2.

The full-height 125M-byte model is called the **5425F**. The **5150F** is a compact 150M-byte model. The **5550FD** holds one or two half-height 150M-byte tape drives or one half-height 150M-byte tape drive and a half-height disk drive.

Standard software allows users to back up an entire disk on a file-by file or specific partition basis. Selected files can be restored from a fast-image backup.

Versions of the 5150F and 5550FD for IBM PCs cost $1,499; for the PS/2, they cost $1,699. The 5425F for PCs costs $1,299 and $1,499 for the PS/2. Xenix versions cost an additional $100.

Cipher, P.O. Box 85710, 10101 Old Grove Road, San Diego, Calif. 92138. 619-578-9100.

A 1.44M-byte 3½-in. floppy disk subsystem for IBM Personal Computer XTs has been announced by **Franklin Telecom.**

The **FDD1.44XT** is an internal subsystem that can be used with IBM PC- or Microsoft Corp. MS-DOS 3.3 or higher with no software drivers. It may be intalled as either drive A or drive B. Each subsystem includes a controller, a drive and an installation kit. Software for disk backup is included.

The subsystem with a single drive costs $425. An IBM PC AT version costs $295.

Franklin Telecom, 733 Lakefield Road, Westlake Village, Calif. 91361. 805-373-8688.

An optical disk-based storage subsystem for IBM Personal Computers and compatibles has been announced by **Aquidneck Systems International, Inc.**

The **PC Access System** allows users to read from and write to the vendor's OAS opti-

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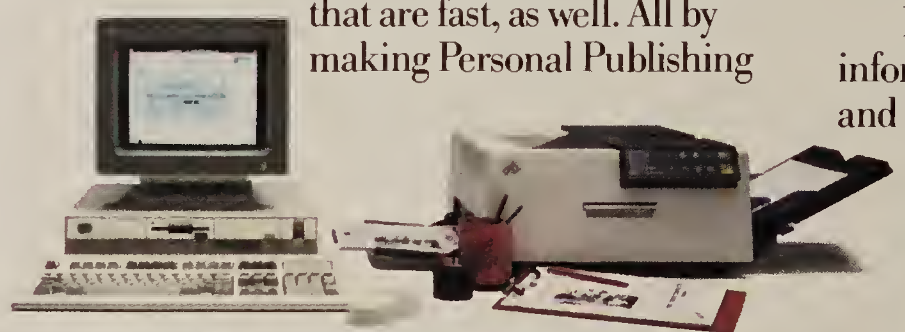
Desktop publishing was invented to help you create handsome documents right in your own organization.

But looks aren't everything. So at IBM, we now make Personal Publishing Systems that are fast, as well. All by making Personal Publishing



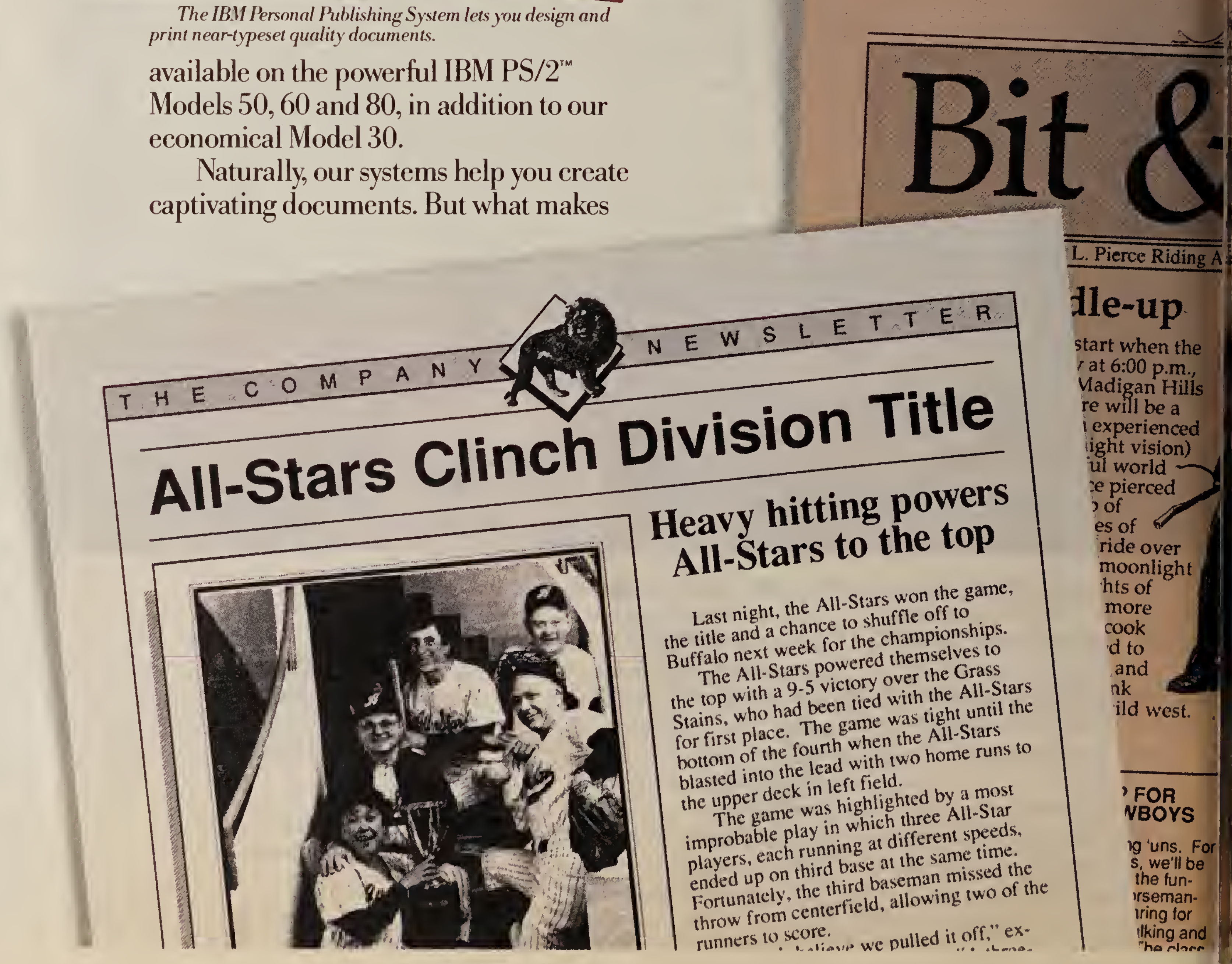
The IBM Personal Publishing System lets you design and print near-typeset quality documents.

available on the powerful IBM PS/2™ Models 50, 60 and 80, in addition to our economical Model 30.

Naturally, our systems help you create captivating documents. But what makes them unique is that they're also built for speed. And the tighter your publishing deadlines, the better our systems look.

How IBM is rewriting performance standards.

In every desktop publishing system, information is passed between the CPU and the printer. And for most systems, that's where the publishing process slows down.



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THE COMPANY NEWSLETTER

All-Stars Clinch Division Title

Heavy hitting powers All-Stars to the top

Last night, the All-Stars won the game, the title and a chance to shuffle off to Buffalo next week for the championships.

The All-Stars powered themselves to the top with a 9-5 victory over the Grass Stains, who had been tied with the All-Stars for first place. The game was tight until the bottom of the fourth when the All-Stars blasted into the lead with two home runs to the upper deck in left field.

The game was highlighted by a most improbable play in which three All-Star players, each running at different speeds, ended up on third base at the same time. Fortunately, the third baseman missed the throw from centerfield, allowing two of the runners to score.

cal disk media.

The system is composed of an optical disk drive, a small computer systems interface card, a cable and a software package compatible with IBM PC- or Microsoft Corp. MS-DOS Version 3.0 or higher, according to the vendor.

The software provides a copy utility, a device driver and an I/O control link. Both 5¼- and 12-in. optical disk drives are supported.

The PC Access System costs from $7,500.

Aquidneck Systems, 650 Ten Rod Road, North Kingstown, R.I. 02852. 401-295-2691.

Relax Technology, Inc. has announced the **Relax SE 171**, an internal hard disk drive for the Apple Computer, Inc. Macintosh SE.

The drive offers 171M bytes of storage and features a 25-msec average access time. It takes the place of the upper 800K-byte floppy disk drive in the Macintosh SE. It includes the vendor's Relax & Save file backup utility, which lets the user back up and restore some or all of the hard-disk files.

The Relax SE 171 carries a price of $3,495.

Relax Technology, #22, 3101 Whipple Road, Union City, Calif. 94587. 415-471-6112.

A nine-track streaming-tape drive designed to meet the data interchange requirements of personal computers and workstations has been announced by **Qualstar Corp.**

The **Minstreamer Model 1260 GCR** drive can store up to 250M bytes on a single tape reel. It incorporates multiple operating sppeds to maintain a constant data rate of 80K byte/sec. It comes with standard buffered Pertec Computer Corp. interfaces or a small computer systems interface (SCSI) and can read and write at 1,600 through 6.3K bit/in. densities.

With a Pertec interface, the product costs $6,975. With a 256K-byte cache buffer, it costs $7,575, and with a 3.2K bit/in. capability, it costs $7,275. An SCSI version with a 64K-byte buffered interface costs $7,995.

Qualstar, 9621 Irondale Ave., Chatsworth, Calif. 01311. 818-882-5822.

A 310M-byte enhanced small-device interface drive for the IBM Personal System/2 Models 60 and 80 has been announced by **Core International.**

Called the **HC310**, the drive features an average access time of 17 msec and can provide transfer rates to 10 MHz. Software allows the drive to be partitioned as one volume and to link multiple drives as one, up to 1G byte.

The HC310 costs $6,495.

Core, 7171 N. Federal Highway, Boca Raton, Fla. 33487. 305-997-6044.

Printers/Plotters/Peripherals

Texas Instruments, Inc. has announced the **Omnilaser 2106**, an Adobe Systems, Inc. Postscript-compatible laser printer.

The printer features 35 resident typefaces and such paper-handling features as a manual paper feed with the ability to accept envelopes and transparencies. It also features interfaces for the Apple Computer, Inc. Macintosh as well as IBM Personal Computers.

The Omnilaser 2106 prints up to six page/min. and has a resolution of 300 by 300 dot/in. It has 2M bytes of random-access memory, four plug-compatible interfaces, including RS-232C, and a Genicom Corp. Centronics parallel interface. Standard emulations include Hewlett-Packard Co. Laserjet Plus and the HP 7475A plotter.

The Omnilaser 2106 costs $4,595.

Texas Instruments, P.O. Box 809063, DSG-163, Dallas, Texas 75380. 800-527-3500.

A version of the **Discover 7320** personal computer-based scanning system has been announced by **Kurzweil Computer Products, Inc.**, a Xerox Corp. company.

The Discover Model 20 features the ability to scan text in four languages — German, French, Italian and Swedish — in addition to English. It also in-

Continued on page 46

desktop publishing
up speed.

One exception is the IBM Personal Publishing System. Our system features a co-processor in the PC, and a high-speed printer interface. That arrangement, along with our 286 and 386 microprocessors, helps you create documents fast.

What's more, IBM makes it easy to get out of the starting blocks.

The IBM PS/2 Models 50, 60 or 80, with the Personal Publishing option, and the IBM SolutionPac™ Personal Publishing System (available with the Model 30) give you everything you need to turn drab documents into something dramatic.

The system includes Microsoft's® Windows, Aldus' PageMaker® and Adobe Systems' PostScript.® It also includes the Personal Pageprinter, IBM's laser printer, and a complete service and support plan.

The system that saves you time can now save you $1,000.

Right now, IBM is offering a $1,000 rebate on the IBM PS/2 Model 80 with Personal Publishing. To find out more about our $1,000 rebate, and The Bigger Picture in personal publishing systems, call your participating IBM Authorized Advanced Products Dealer, or your IBM Marketing Representative today.

IBM The Bigger Picture

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Continued from page 45

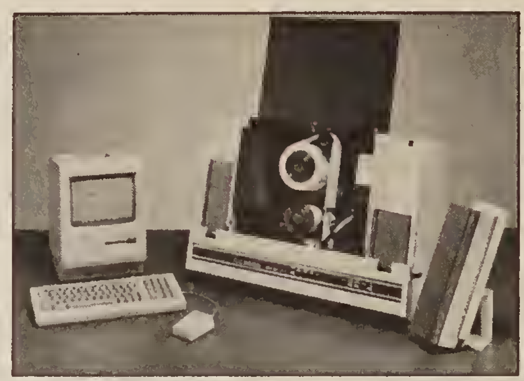
cludes a landscape mode that enables users to rotate images 90 degrees on a PC screen.

The Model 20 comes with the vendor's software, a user interface and documentation, a coprocessor board with 4M bytes of random-access memory and a desktop scanner. It costs $11,950.

Kurzweil, 185 Albany St., Cambridge, Mass. 02139. 617-864-4700.

Applied Data Communications, Inc. has announced that its multifunction robotic disk handler for duplicating, printing and labeling 3½-in. diskettes is now compatible with Apple Computer, Inc.'s Macintosh SE and Macintosh II.

Copymaker Plus performs copying, labeling and printing operations simultaneously.



The Copymaker Plus *disk handler*

For double-sided, double-density diskettes, the average throughput rate is 64 sec., with complete memory test and verification of copied data.

For printing labels, Copymaker Plus uses an internal nine-pin dot matrix printer capable of printing 15 lines of 23 ASCII uppercase and lowercase characters per label, the vendor said.

Copymaker Plus costs $15,590.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680. 714-731-9000.

A video port expander for the IBM Video Graphics Array standard that works with all four models of IBM's Personal System/2 has been announced by **Network Technologies, Inc.**

The **Vopex-8V** allows eight monitors to be driven by a single PS/2 at distances up to 50 ft from the computer. All eight output ports are individually buffered.

The Vopex-8V costs $899.

Network Technologies, 19145 Elizabeth St., Aurora, Ohio 44202. 216-543-1646.

Summagraphics Corp. has introduced a version of its **Bit Pad Plus** graphics tablet for the Apple Computer, Inc. Macintosh family of personal computers.

Bit Pad Plus is based on the vendor's Charge Ration technology. It is a 12- by 12-in. tablet and comes with a stylus and a special interface device.

The Macintosh version of Bit Pad Plus costs $495.

Summagraphics, 777 State Street Extension, Fairfield, Conn. 06430. 203-384-1344.

A color transfer system for laser printer presentations has been announced by **Kroy, Inc.**

Called **Kroy Color Plus**, the system adds color to documents created on laser printers.

The user sandwiches the laser-printed or photocopied page with a color transfer sheet of the desired color.

The sheet is then passed through the processor, which bonds the color to the toner image within 30 seconds, the vendor said.

Color Plus is priced at $875.

More than 50 colors of transfer film are available, including metallic foils. They carry a price of about $60 per carton.

Kroy, P.O. Box C-4300, Scottsdale Airpark, Scottsdale, Ariz. 85261. 602-948-2222.

An 18 page/min laser printer has been introduced by **Kyocera Unison, Inc.**

The **F-3010** compact laser printer offers 300 dot/in. resolution. Features include seven built-in emulations, such as the Hewlett-Packard Co. Laserjet Series II, the Epson America, Inc. FX-80, the Qume Corp. Sprint II, the IBM Graphics Printer, the NEC Corp. Spinwriter, the Xerox Corp. Diablo 630 and a generic line printer. Also included are 79 resident fonts and Kyocera's Prescribe control language.

The F-3010 has 1.5M bytes of standard random-access memory expandable to 3.5M bytes. It costs $8,395.

Kyocera Unison, P.O. Box 3056, 3165 Adeline St., Berkeley, Calif. 94703. 415-848-6680.

Copal U.S.A.'s *Writehand 5930*

A dot matrix printer offering a 480 char./sec. print speed in draft mode has been introduced by **Copal U.S.A.**

The **Writehand 5930** employs a 16-bit processor and offers 10 char./in. draft-quality printing at 400 char./sec. and letter-quality printing at 80 char./sec. The standard 16K-byte buffer is expandable to 256K bytes.

The Writehand 5930 comes standard with Epson America, Inc. FX and IBM Proprinter XL emulation. It costs $1,100.

Copal, #105, 2291 205th St., Torrance, Calif. 90501. 213-618-0225.

There's only one DASD tuning tool that does it all.

DASDMON is a real-time and batch DASD performance tuning tool for MVS and MVS/XA. It collects critical performance data, identifies problems, and recommends specific tuning actions. It's like having your own DASD consultant 24 hours a day.

Unique Cache Statistics

DASDMON offers real-time displays that show cache utilization. Only DASDMON collects cache read/write ratios and read-hit statistics to the job and data set level. These statistics show whether or not a data set is a good cache candidate.

Identifies Exact Problem Areas

Define your performance goals, and let DASDMON measure against them. If these goals are not met, then data is automatically collected for analysis and the following problem areas are identified:
- Path contention
- Volume contention
- Cross-system reserves
- Excessive seeking
- Data set contention

Recommends Specific Actions

To improve identified problem areas, DASDMON's Data Set Placement Manager (DSPM) component provides reports that clearly state specific tuning adjustments. DSPM reports are based on a data base of repeated performance problems that DASDMON maintains. The recommendation may include moving a data set across a path or reorganizing a volume—quick solutions to common problems.

Only DASDMON has successfully met the challenge for complete DASD tuning.

Call us today to arrange for a free 30-day trial.

Let DASDMON eliminate your frustrations.

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Speed and endurance you can bet on.

Introducing a true thoroughbred among 24-wire printers, the new Hewlett-Packard RuggedWriter 480. It's the fastest printer in its class pounding out letter quality text at a furious 240 cps. And breaking the record for draft copies at 480 cps. So you get a full page of text in less than 10 seconds flat.

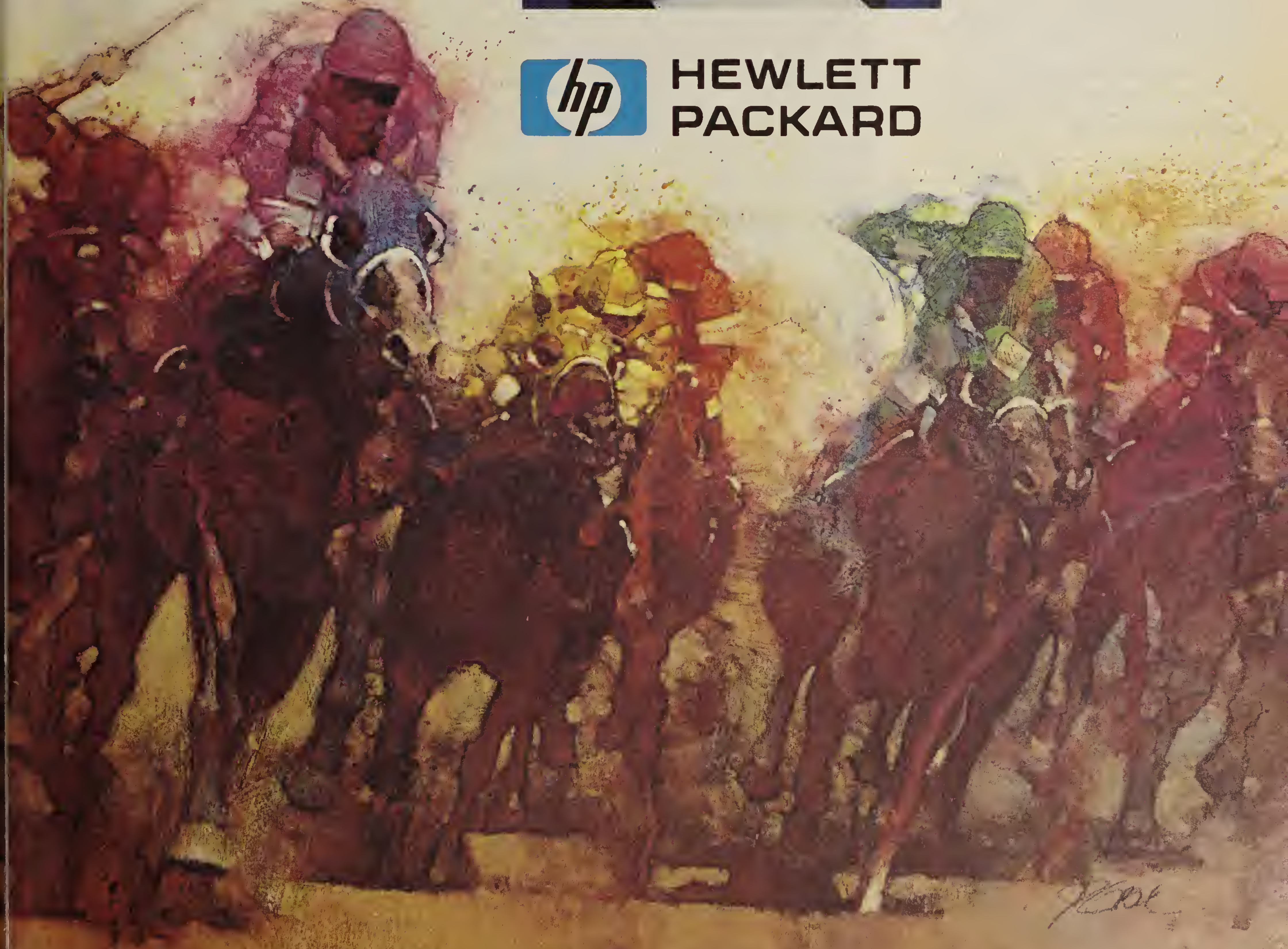
We take the lead in endurance, too. Our new RuggedWriter printer outlasts the competition by a longshot. Running a strong 20,000 hours MTBF, RuggedWriter reliability pays off big in keeping your projects on track.

Our pace doesn't slack off when changing paper types either. Just one push of a button takes you from tractor feed to cut sheet—instantly. All while producing crisp, clean letter quality printing. For everything from spreadsheets to memos to multi-part forms.

The RuggedWriter 480 printer performs equally well for one person or five. On either a personal computer or small business system.

So take an inside tip and put your money on the industry frontrunner, the HP RuggedWriter 480 printer. Call your local HP sales office or dial 1-800-752-0900, ext. 905A and ask for the RuggedWriter Fast Pack. It's a sure bet.

hp HEWLETT PACKARD



87 Hewlett Packard Company

Board-level devices

A plug-in card designed to facilitate the migration of Texas Instruments, Inc.'s Business System software to IBM Personal System/2 microcomputers has been announced by **Ten X Technology, Inc.**

Called **X-Porter**, the card is said to allow multiuser applications written for TI's DX10 operating system to run on IBM PS/2 Models 50, 60 and 80. According to the vendor, X-Porter does not require any software development, relinking or recompiling of programs.

The package consists of a single board with 512K or 1M byte of local random-access memory and software that generates the DX10 environment. It creates a multiuser, multitasking network for up to three users.

X-Porter for the PS/2 is priced at $3,550.

Ten X, Suite B114, 3933 Steck Ave., Austin, Texas 78759. 512-346-8360.

A line of memory expansion boards for IBM Personal Computers, PC ATs and Personal System/2s has been announced by **Systems Manufacturing Technology, Inc.**

The **Acuram-8meg** is a 2M- to 8M-byte dynamic random-access memory card for the PS/2 Models 50 and 60. The **Acuram-15meg** is a 15M-byte dynamic RAM card for the PC AT and compatibles.

According to the vendor, on-board firmware locates other RAM cards and automatically reconfigures the Acuram cards to use the available addresses. Full-board diagnostics are performed with power up.

The Acuram cards cost $599 each.

Systems Manufacturing Technology, 1145 Linda Vista Drive, San Marcos, Calif. 92069. 619-744-3590.

Hercules Computer Technology, Inc. has reduced the price of its **Incolor** video card for the IBM Personal Computer and Personal System/2.

The Incolor board is a color version of Hercules' Graphics Card Plus. It is said to be compatible with all standard text programs that support the Hercules monochrome graphics standard and programs that make use of the Hercules Ramfont display mode.

It can display 16 colors out of a palette of 64 in 720- by 348-pixel resolution. It requires a multisynchronous color monitor or IBM's Enhanced Color Display.

The Incolor card is priced at $349.

Hercules, 921 Parker St., Berkeley, Calif. 94710. 415-540-6000.

A graphics board that is said to provide Hercules Computer Technology, Inc.-compatible monochrome graphics as well as I/O expansion capabilities to IBM Personal Computers and compatibles has been announced by **Boca Research, Inc.**

The **Mono-Master/Plus** board allows users to display any graphics software on a monochrome monitor with resolution of up to 720 by 348 pixels, the vendor said.

The Mono-Master/Plus also provides a 25-pin parallel port, a 25-pin serial port and an optional game port.

Mono-Master Plus carries a price of $199.

Boca Research, 6401 Congress Ave., Boca Raton, Fla. 33487. 305-997-6227.

A data acquisition and process control board designed for the IBM Personal System/2 Models 50, 60 and 80 has been announced by **Scientific Solutions, Inc.**

Called the **MC-DAS 1612**, the single-slot board implements the PS/2's Micro Channel interface. It performs burst-mode direct memory addressing transfers as an I/O slave, and all connections to the board are brought out through a 37-pin D shell connector.

The analog-to-digital conversion is based on a single multiplexed 12-bit successive approximation converter with an 8.5-msec conversion time.

The MC-DAS 1612 costs $995.

Scientific Solutions also announced the **MC-IEEE 488**, an IEEE 488 interface for the PS/2 Models 50, 60 and 80. It costs $395.

Scientific Solutions, 6225 Cochran Road, Solon, Ohio 44139. 216-349-4030.

An Intel Corp. 80386-based satellite board for the S-100 bus has been announced by **Macrotech International Corp.**

Called the **MI386S**, the board is compatible with Concurrent DOS environments and runs on such systems as Macrotech's M1286 and Compupro Corp.'s 8085/8088. Up to seven satellites can be installed in a system, the vendor said; each satellite has 1M byte of memory.

The MI386S costs $2,667.

Macrotech International, Bldg. 5, 21018 Osborne St., Canoga Park, Calif. 91304. 818-700-1501.

An eight-bit color graphics board for use with Apple Computer, Inc.'s Macintosh II has been announced by **Jasmine Technologies, Inc.**

According to the vendor, the **Rembrandt I** board will be offered with a choice of 15- or 19-in. monitors and will provide users with 256 simultaneous displayable colors and resolutions ranging up to 1,024 by 768 pixels. It operates in both one-bit monochrome and eight-bit color modes in all resolutions.

The board is fully compatible with Quickdraw, Apple's graphics interface.

Rembrandt I costs $995. The 15-in. monitor costs $2,395, and the 19-in. monitor costs $2,795.

Jasmine, 555 De Haro St., San Francisco, Calif. 94107. 415-621-4339.

ShowCASE

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Today, everybody seems to be offering PC-based front-end analysis and design tools. Their makers credit them with providing screens that can drive Computer Aided Software Engineering. We credit them with providing smoke screens. Because once you've created a diagram on the PC screen with one of these, it just sits there—it isn't integrated with any of the other tools you need to get the job done.

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Mitac plans to introduce PS/2 Model 30 clone in May

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Mitac International Corp., a Taiwanese IBM Personal Computer compatible manufacturer, said recently it plans to introduce what it claims will be the first Personal System/2 compatible on the market.

But Mitac is not cloning the complex and legally challenging Micro Channel architecture bus. Instead, the firm is going after what some call "easy pickings" — the IBM PS/2 Model 30.

Through its U.S.-based subsidiary, American Mitac Corp., Mitac reportedly will formally unveil in May a PS/2 Model 30 clone said to offer 10-MHz performance, Video Graphics Array (VGA) technology and support for the latest Lotus/Intel/Microsoft Expanded Memory Specification Version 4.0, at a cost not yet set but estimated to be between $800 and $1,100.

The Model 30 uses the Multi Color Graphics Array, not the VGA.

In comparison, the basic IBM Model 30 configuration lists for $1,695, but often it is heavily discounted. IBM's system runs at 8 MHz. The Mitac system reportedly offers four full-height expansion slots vs. the Model 30's three.

In addition to Mitac, at least one other Taiwanese-based microcomputer maker, Acer Technologies, Inc., is reportedly planning to enter the PS/2 Model 30-compatible market this spring. Acer, a San Jose-based division of Taiwan-based Acer Group and formerly known as Multitech Electronics, Inc., has designed a Model 30 clone with its own chip set that will run at 9 to 10 MHz. Acer will probably release two versions of its Model 30 look-alike, one with two expansion slots, the other with four, according to Victor Woo, senior vice-president.

Model 30 compatibility is a safe, legal bet, since IBM has continually vowed to protect its Micro Channel architecture through strict patents. The Micro Channel is found on the PS/2 Models 50, 60 and 80. "To make a Model 30 compatible is like making an IBM PC XT compatible, and you don't need a lot of licenses from IBM," said C. K. Cheng, assistant vice-president of U.S. sales. However, Mitac is currently talking with IBM about cross-licensing agreements in general, he added.

Although PS/2 Model 30 chip sets are available from such vendors as Chips and Technologies, Inc., Mitac has jointly developed its own Model 30-compatible chip set with a lesser known U.S. semiconductor supplier it would not identify. The Mitac MPS-100L is said to be register-level compatible with IBM's Model 30 and offer a BIOS from Phoenix Technologies Ltd.

Bigger plans in store

Mitac is easing into the PS/2 compatibility market by first introducing a Model 30 and is set to announce a Model 50 Micro Channel-compatible machine later this year, according to Keddy Chen, company spokesman. Mitac is a relatively unknown microcomputer manufacturer distributing mostly to OEMs and value-added resellers.

"Corporate America is already used to buying clones, so acceptance in the PS/2 Model 30 world should be faster than it was originally in the PC market," said Steve Hess, director of the minimicrocomputer group at consulting firm Creative Strategies Research International in Santa Clara, Calif. There will be some initial hesitation, Hess added, toward a lesser known Taiwanese company's clone. But "at prices lower than Big Blue's, corporate America will at least look at them seriously," he said.

Some specifications for the machine, however, were still being sketched out last week. For example, the company has not decided between the Intel Corp. 8086 and the NEC Corp. V30 microprocessors, although Mitac is "leaning toward" the V30, Chen said.

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Mac Plus

CONTINUED FROM PAGE 33

based Macintosh II. The Mac SE and the Mac II could be expanded through the use of internal slots.

The entry-level model in its Macintosh line was phased out last summer. Hashimoto predicted that the Macintosh Plus will be phased out of the Mac line shortly. Last year, Apple shipped 281,000 Macintosh Pluses worldwide, according to Dataquest. In comparison, Apple delivered 340,000 Mac SEs worldwide.

The company also trimmed prices on three hard disk drives containing small computer systems interfaces for the Macintosh.

The price of a 20M-byte hard drive has been cut to $1,099 from $1,299; a 40M-byte drive is now priced at $1,699, down from $1,999; and an 80M-byte drive costs $2,799, down from $3,199. Introduced in January 1986, the Macintosh Plus contains 1M byte of RAM and is priced at $2,199.

Silicon tools take networking tack

BY JAMES A. MARTIN
CW STAFF

ANAHEIM, Calif. — Silicon Graphics, Inc. unveiled a series of tools last week that reportedly enhance the networking capabilities of its Iris 4D Superworkstation family of reduced instruction set computing graphics workstations.

Iris systems are used for such functions as automobile design and prototyping.

The new products, called the 4D Workgroup, are scheduled for July availability and were designed to improve functions in three major areas of networking: access, distributed graphics objects and resource sharing.

Among the products are emulation packages said to enable Iris workstations to download IBM mainframe VM and MVS files and conduct IBM 3270 or 5080 sessions using that data. Prices are $12,000 for 4D5080 and $2,000 for 4D3270.

Other connectivity tools include 4DDN, a $3,000 tool said to access applications on Digital Equipment Corp.'s Decnet VAX systems.

Silicon's 4D Hyperchannel, priced at $10,000, connects users to a Cray Research, Inc. supercomputer to enable Iris workstation users to transform large volumes of data into graphic images. IBM Personal Computer emulation is offered via 4Dsoft PC, priced at $795.

A network server system, the $49,000 4server, runs at 16 MHz and is said to process more than 13 million instructions per second. The network server also provides up to 9G bytes of disk storage and up to 144M bytes of on-board memory.

Vortex

FROM PAGE 33

tions such as brokerage firms and government agencies, in which security or an audit trail are important, Kato said.

The VAS 1000 may also be applicable for computer-aided design and engineering work, for which users sometimes need to retrieve a previous version of a sketch. "It is not ready for mass market because of the cost," Kato said.

The system can also help a user avoid data loss when exiting an application without saving a file or because of a power problem. The user can return the computer to its state before the data was lost and begin working again, the vendor said.

The system captures each of the computer's activities, compresses the data and routes it through a 20M-byte hard disk drive to its final destination in the write-once read-many drive.

GEM revamp

FROM PAGE 33

Digital Research said the software offers additional ease of use and flexibility by allowing three modes of menu operations. The user can click on a menu, use autodrop-down or use pull-down menus.

Other enhancements are paper tray selection options and support for a variety of paper sizes, including European standard-size paper. Enhanced control of print positioning on the page is offered. Special symbols, such as trademark and copyright, and international characters are also supported, the company said.

The package includes support for Hewlett-Packard Co.'s Laserjet printers and improved Adobe Systems, Inc. Postcript support on the Apple Computer, Inc. Laserwriter and Laserwriter Plus in addition to other Postscript-compatible laser printers and typesetters.

Using GEM/3 and the included Bitstream Fontware Installation Kit, users can reportedly generate HP Soft Fonts and Postscript-compatible fonts. Once generated, other non-GEM applications running on the user's computer can use the fonts as well, the company said.

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The Colorgrafix 100 maximizes speed, too. It produces a full-color 8½"x11" page or transparency in about a minute. An 11"x17" page in under two. Other printers can take 30 minutes, even longer. In print quality, its 300x300-dot-per-inch resolution equals electrostatic printers that cost three times more.

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BIDS & PROPOSALS

R.F.P.

Project ABACUS
Computing System Proposal
for
Financial Services

THIS IS MY FIRST
PASS AT THE BANKING
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PULLED OUT THE MAJOR
REQUIREMENTS AND PROVIDED
WANG RESPONSES.
YOUR THOUGHTS
JIM 3/1/88

JIM
PLS. SEE MY
MARGIN COMMENTS
TOM 3/11/88

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WE'VE LEARNED THIS BY LISTENING TO OUR CUSTOMERS

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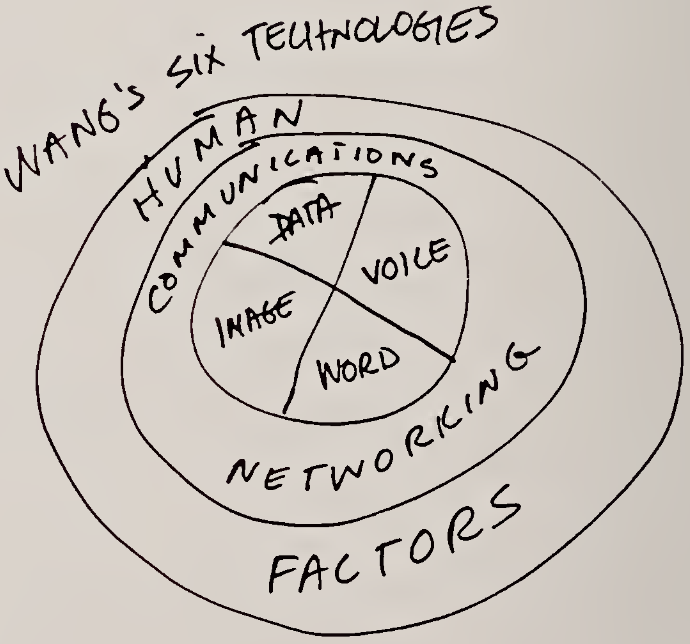
2. COMPLETE SOLUTIONS
3. MULTI-VENDOR ENVIRONMENTS
4. REALIZATION OF PAST INVESTMENTS
5. SENSITIVITY TO THE USER
6. LONG-TERM RELATIONSHIP

WANG IS THE SYSTEM INTEGRATOR



N.B.

This is a representation, not an actual, Request For Proposal. It is designed to demonstrate Wang's preparedness to meet the challenges that face the financial services industry. It is intended to provide summary information for data processing and financial service professionals. We have chosen a banking model in this "representative" RFP only as a way to examine Wang's offerings in one single segment of the diverse financial services industry.

We welcome your comments and invite your input.

Management Overview

Intensifying competition in the banking segment requires increased attention to the issues of customer service and productivity. The bank must bring to market higher quality services more rapidly and at lower cost. A fully integrated information system is at the heart of this effort. An advanced system environment is essential to enable the bank to get maximum return from existing personnel, develop superior banking products and most important, provide a maximum level of customer service.

Project ABACUS Description

ABACUS (Advanced Banking and Customer Service) system objectives are to place the bank in a position to:

- reduce overhead in order to increase margins
- improve efficiency
- be more responsive to market opportunities and increase competitive edge.

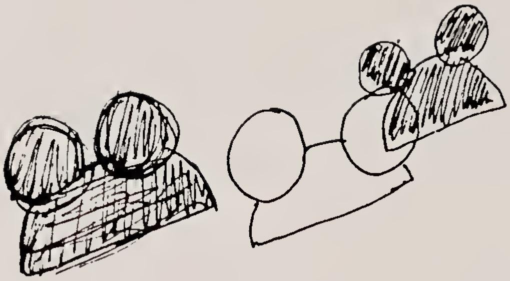
The bank intends to achieve the project ABACUS objectives by acquiring an advanced systems environment that has a modular structure in which the modules combine to support decisions.

To accomplish this, the bank intends to install an advanced business computer solution which will create a sophisticated information system environment. The computer system must employ integrated modules, each of which provides an essential contribution to business operations.

The bank requires advanced customer communications access technologies aimed at maximizing first-hand customer interactions with our product and services. Proposed access technologies must be proven compatible with our current installed systems. [Appendix B] Although not a mandatory requirement for the RFP, vendor should outline their offering in voice response technology.

Wang Response

Wang's solutions incorporate leading-edge customer access capabilities. Wang STEP (Speech & Telephony Environment for Programmers) transforms a customer's telephone into a vehicle to access database information for banking products such as DDA balances, revolving credit lines, stock quotations, etc. Industry standard and Wang terminals provide dial-up access to applications for funds transfer, buy-sell orders, market data, break-even analysis, and more.

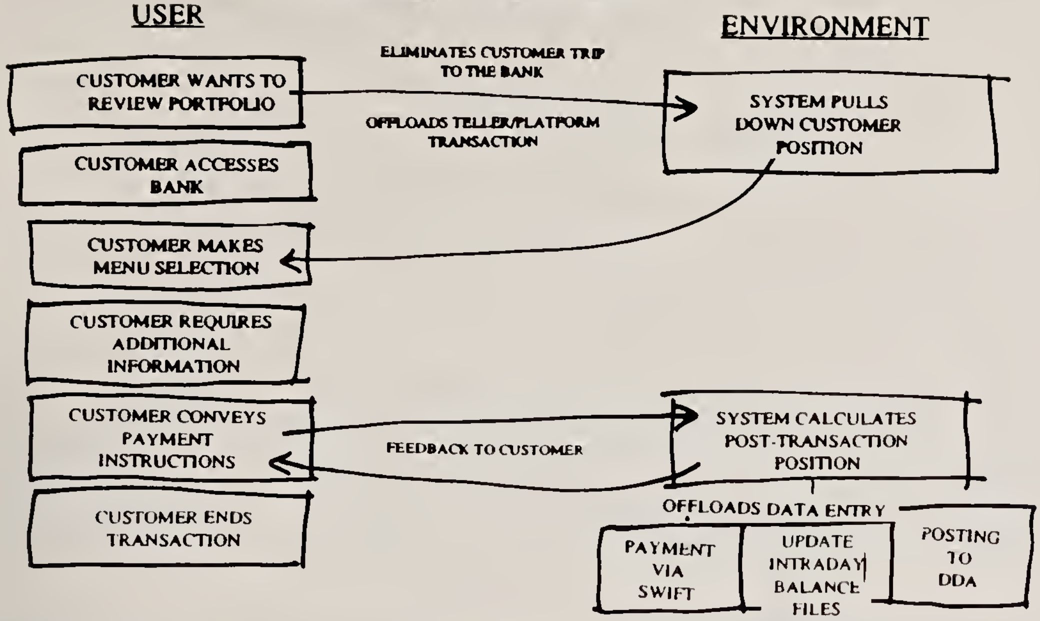


HAMMER THIS
ONE HOME !

ATTACH A FEW
SUCCESS STORIES

THE INTEGRATION IS
WHAT SEPARATES WANG,
BUT IS HARD TO GRASP.
SEEING IS BELIEVING
SUGGEST A DEMO

CUSTOMER ACCESS FLOW


USER
ENVIRONMENT
CUSTOMER WANTS TO REVIEW PORTFOLIO
ELIMINATES CUSTOMER TRIP TO THE BANK
OFFLOADS TELLER/PLATFORM TRANSACTION
SYSTEM PULLS DOWN CUSTOMER POSITION
CUSTOMER ACCESSES BANK
CUSTOMER MAKES MENU SELECTION
CUSTOMER REQUIRES ADDITIONAL INFORMATION
CUSTOMER CONVEYS PAYMENT INSTRUCTIONS
FEEDBACK TO CUSTOMER
SYSTEM CALCULATES POST-TRANSACTION POSITION
CUSTOMER ENDS TRANSACTION
OFFLOADS DATA ENTRY
PAYMENT VIA SWIFT
UPDATE INTRADAY BALANCE FILES
POSTING TO DDA

The bank considers data access to be a high priority at every level of the bank. Our requirements include customized data presentation and basic application development at the user level. Additionally, vendors should present their capability in the area of imaging and image processing especially as it applies to bank documents typically stored off-line in paper form.

Wang Response

Wang's fourth generation language offering, PACE, uses a relational DBMS which allows the entire user community within the bank to share select data pertinent to their work as tellers, relationship managers, bank officers, CEO's, etc.

PACE is unique in its ability to effectively manipulate data, text, voice and image files.

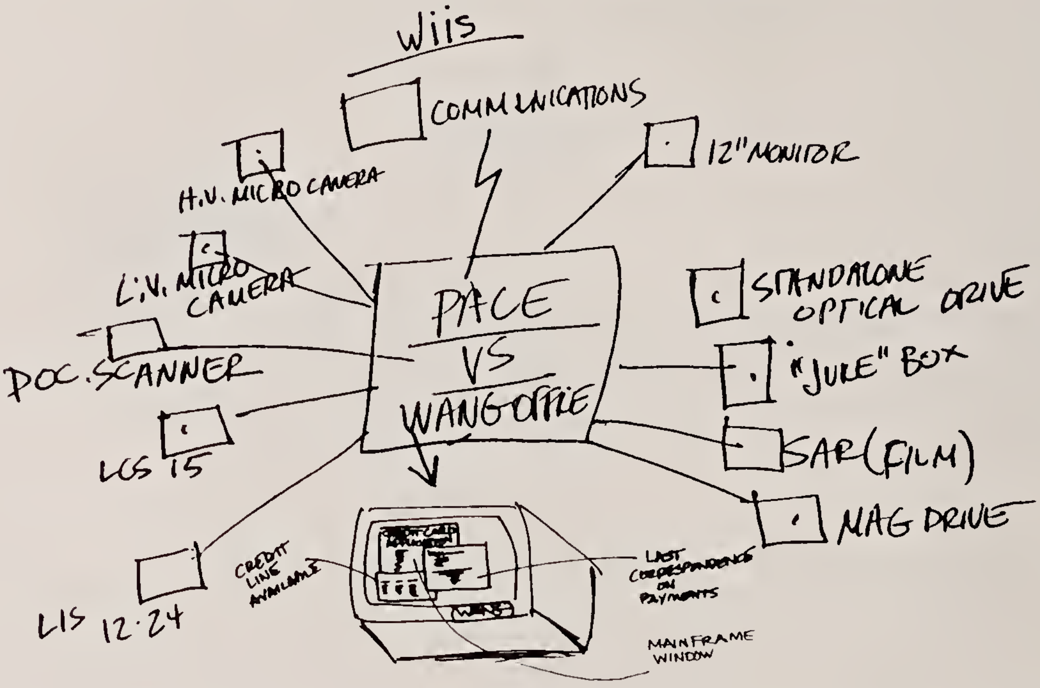
PACE also allows users to develop complete applications without needing the skills of a professional programmer.

Wang, as part of the strategic relationship, will provide a comprehensive needs analysis in order to best apply PACE in the environment.

When compared to traditional development methods, PACE provides significant reductions in application development lead times.

WIIS, Wang's Integrated Image System, is a comprehensive system for managing, processing and communicating text, data and imaging information. The bank can capture documents in image form, such as loan applications, letters of credit, pledges of collateral, P & L statements, etc. that are currently stored off-line in paper form.
The system allows the bank to improve customer service, reduce filing and storage costs and improve management and handling of paper documents.

This means that the bank officer can on a single workstation and, with the touch of a button, access a mainframe window, a Wang VS window, as well as "photocopies" of all the documentation signed by the customer and the bank.



The bank sees user acceptance and user sensitivity to new technology and systems as a chief concern especially as it relates to performance on the job and overall employee well-being. Each vendor is required to explain in specific terms how their system addresses these human factors.

Wang Response

Wang brings to the bank project a history of acclimating users to complex technology. Wang remains dedicated to designing systems which do not require replacement of familiar systems or complicated retraining.

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For more than a decade Wang has maintained a consistent user interface. Additionally, because of our single architecture and corporate commitment to preserving your investment in application software only minor changes are required to run programs that may also be ten years old.

YOU MUST DISCUSS WANG OFFICE
ROLE AS AN APPLICATIONS INTEGRATION
UTILITY —

In response to this RFP, each vendor must set forth its ability to meet the following requirements in the area of applications development:

- ✓ adherence to bank's corporate data standards
- ✓ project management services for project design, such as man-year requirements, critical path, and system capacity planning
- ✓ code efficiency measurement
- ✓ conformance with all industry-standard languages.

← INCLUDE WANG SOLUTIONS CATALOG

Wang Response

Wang conforms to all standard industry languages, including COBOL, RPG II, C language, FORTRAN, PL/1, BASIC, and ASSEMBLER. Further, Wang's solution enables rapid development of code using an integrated interactive set of compilers, debuggers, and editors. Tasks such as analysis, design, prototyping, coding and testing are facilitated by the system.

Address safety and security capabilities. Each vendor should indicate its ability to comply with the bank's rigid safety and security requirements. Cite specific security options available.

Wang Response

The family of Wang VS 32-bit processors with extended security access control option provides:

- *event logging and violations*
- *scheduled user access times*
- *last logon notification*
- *password encryption and suppression*
- *user time out*
- *single or multiple logon*

INSUFFICIENT—APPEND VS SECURITY FEATURES USER GUIDE

Additionally, the entire family of Wang SAFE products have incorporated the SWIFT II standards. Market data feed applications such as SHARK also incorporate similar storage/warehousing design.

The communications module must provide at a minimum seamless bridges into the following communications protocols:

- SNA/SDLC
- RJE 3777
- 2780/3780
- CCITT X.25
- IEEE 802.3
- IEEE 802.5

Additionally, vendor must have at least a statement of direction with respect to compliance with the Open Systems Interconnect model. Also, the environment must be able to present a unified appearance to the user community and further, facilitate a smooth transition across the bank's diverse installed base of equipment.

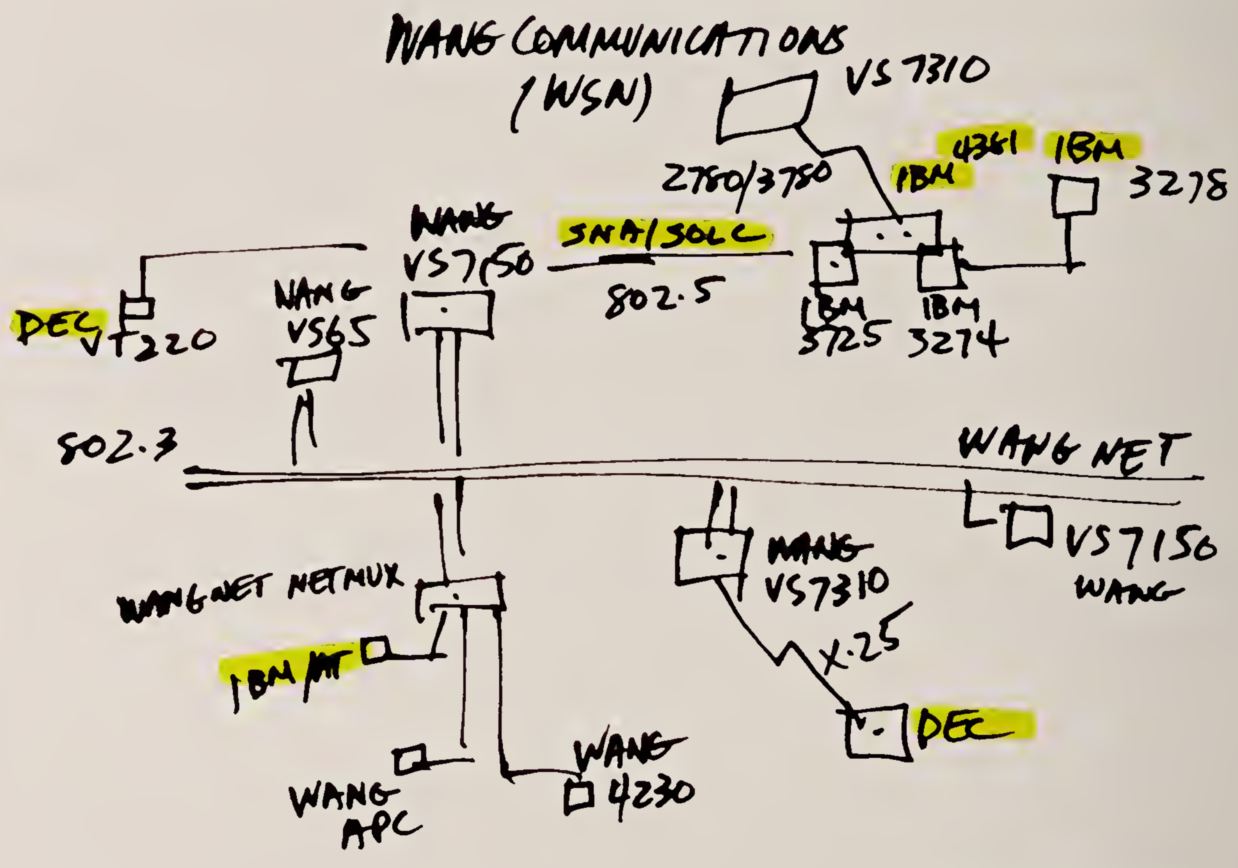
Wang Response

The Wang solution employs an integrated strategy for large-scale systems networking. Wang Systems Networking makes transparent the differences in the local and wide area networking protocols, therefore providing seamless communications across the entire organization. Wang not only connects a corporate network through multi-vendor integration, but also provides the ability to manage and administer the network as well.

← DON'T FORGET — IT'S WANG & NON-WANG

Wang's solution accomplishes this by means of the Distributed Management Facility, which manages both the Wang implementation within the building and the wide area network. All network management can be centralized at the system operator's console or be decentralized as required, from host level to terminal. The operators can run backups and download new versions of code, all from the network control center.

As to standards, Wang solutions conform to de facto and generally accepted industry standards.



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NEC releases hard-disk Multispeed lapt
SOFTWARE NOTES
Broker workstation tools
MAP users group lays down law
BY KATHY CHIN
ot future or DP pros
IBM slow to reme
DB2 security
Continued on page 10

Printware releases Postscript clone

BY STEPHEN JONES
CW STAFF

ST. PAUL, Minn. — Claiming to be the first company to ship a clone of Adobe Systems, Inc.'s Postscript language interpreter, Printware, Inc. released Printscript last week.

The package was designed to give users running Printware's 720IQ Laser Imager printer full compatibility with the Postscript language. Printware's printer boasts 1,200 by 600 dot/in. laser output, the vendor said.

The Printscript interpreter is bundled with Printware's Image Processor printer controller and sells for $6,270.

The package is also said to be compatible with Hewlett-Packard Co.'s Laserjet printer and a handful of dot matrix machines.

High compatibility

Printware, a manufacturer of high-resolution laser printers, said the interpreter can interface with a variety of software publishing packages, including Aldus Corp.'s Pagemaker, Xerox Corp.'s Ventura Publisher and Laser Friendly, Inc.'s Office Publisher.

The Image Processor component of the package requires a minimum of 1M byte of random-access memory and a multiple page buffer.

Printers with Printscript will be configured with 13 typeface outline masters, the vendor said.

Additional fonts can be downloaded from a host computer. With the package, users can create font sizes ranging from 0.1 to 720 points.

The package supports such editing options as kerning, multiple fonts per line, rotating, shading and reverse type, according to Printware.

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See us at INTERFACE '88 Booth #1960

Tandy claims SCSI board for AT a first

BY ED SCANNELL
CW STAFF

FORT WORTH, Texas — Tandy Corp. has announced what it said is the first small computer systems interface (SCSI) adapter board for IBM's Personal Computer AT machines. The firm also announced a compatible 80M-byte hard disk drive.

Tandy said the products allow its Model 4000 system to be used as a more effective file server. With the adapter and drive, the company is positioning the system directly against IBM's Personal System/2 Model 80.

Tandy claimed the SCSI-compatible products raise the Model 4000's disk throughput speed to that of a PS/2 Model 80 equipped with a 115M-byte hard disk drive and running under Microsoft Corp.'s MS-DOS.

The SCSI board supports up to three internal storage devices with capacities ranging from 40M to 768M bytes. The adapter board, which contains a 16-bit 10-MHz chip, has a transmission rate of up to 10M byte/sec. and an average disk access time of 28 msec, a spokesman said.

To implement the products, the vendor said, users running MS-DOS must plug in the adapter card, install the hard drive in any internal drive slot and format the hard drive. The SCSI works without a device driver.

The adapter board is priced at $299.95; the 80M-byte hard drive costs $1,799. Both products are available immediately.

Drive aims to check integrity

BOCA RATON, Fla. — Rodime, Inc. has introduced the Rodime RO 5130 R, a 133M-byte, half-height, 28-msec drive. The system will be sold to OEMs and value-added resellers, which will in turn sell the product to end-user organizations. It may also be sold directly to user organizations capable of customizing systems.

The half-height Winchester disk drive, intended for use with a run-length limited controller, was designed to maintain data integrity with such controllers.

Gary Janz, Rodime's director of product marketing, said the run-length limited hard disk drive is intended to add disk capacity and speed for less than $850.

Rodime also announced that all members of its RO 5000 series of disk drives are shipping with enhanced small-device interfaces (ESDI). The half-height 5¼-in. drives are also offered with an embedded small computer systems interface controller and a Rodime ST 507/412 interface.

Janz said the ESDI interfaces will allow customers to either design their own controllers or use off-the-shelf controllers.

The drives are set to sell for approximately $1,200.

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As a networking leader, Novell has pioneered the tremendous rise in PC-based networks. Today, Novell's vision of networking starts at the desktop and expands outward toward the goal of total computer connectivity.

That vision begins with NetWare,® the recognized standard for local area network operating systems. With an installed base of over a million workstations, NetWare puts power in the hands of network users at all levels: from ELS NetWare, for entry-level solutions, to SFT™ NetWare, providing high-performance system fault tolerant networking.

Beyond NetWare, Novell offers PCOX™ software for linking PCs and LANs with mainframes and minicomputers. And bridging software to connect separate LANs.

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be seeing red.

Novell also provides programming tools like MHS, and Btrieve® and XQL® file management software. Plus extensive support for independent developers of network applications.

With all these software products and more, Novell gives greater flexibility and reliability to your network. And pushes the total networking spectrum closer to seamless connectivity.

End your search for powerful network software. See your Authorized Novell Gold Reseller, or call 1-800-LANKIND.

For more information, call from your modem 1-800-444-4472 (300-1200 baud, 8 bit, no parity, 1 stop bit) and enter the access code NVSOF7.

NOVELL

For network solutions, you should be seeing red.

Scannell

CONTINUED FROM PAGE 33

Quattro hits six figures. Borland has announced that sales of its Quattro spreadsheet surpassed the 100,000 mark in just four months. However, the product's jackrabbit start has to be attributed in part to its 90-day introductory price of $199.95.

As of last week, the product's price was raised to its permanent retail price of $247.50. It'll be interesting to see if Borland can sustain most of this enormous momentum during the next four months. Given the product's features, we suspect it will.

Central to its success will be its speed and its compatibility with Lotus's 1-2-3, which goes right down to the macro level. With its low price and minimum requirements, Quattro has a good shot at cracking a million in unit sales and becoming a serious competitor to 1-2-3.

Hot as the Sun. Benchmarks recently conducted by Workstation Laboratories on Sun Microsystems' Sparc-based Sun-4/260 showed it's almost twice as fast as competing systems. The tests measured the system's I/O, CPU and floating-point performance. The Sun-4/260's Khornerstone rating was 12,474 compared with 6,220 for IBM's reduced instruction-set computing-based RT Personal Computer. Compaq's 16-MHz Deskpro 386 had a rating of 1,941 and IBM's PS/2 Model 60 came in at 1,103.

Dark side of the moon. David Gilmour, who heads up Lotus's Advanced Product Group, isn't someone who is often confused with the lead guitarist of a rock group. However, because he has the same name as one of the founders of Pink Floyd, we understand he's been getting some strange looks at hotels lately when he checks in. "Excuse me sir, but are you . . ."

It might be intersting, though, if the two Gilmours traded places for a year or so. I'm sure the other members of Pink Floyd could expand their musical programming talents, and Lotus's DBMS would have a better chance at topping the rock charts.

You're the disease, I'm the cure. Need a little something to cure those nasty computer viruses going around? Digital Dispatch's Data Physician may be just what you need. The program reportedly detects a "virus activity" in files and system areas and can remove certain types of viruses from an infected program. Data Physician, which works with both DOS- and Unix-compatible machines, runs in the background, so it can continuously monitor a system. The DOS version goes for $199; the Unix version costs $895.

Name of the week. This week's award has to go to Integrated Systems in Kirkland, Wash. "Ask God," through a natural language interface, lets users ask a question, which is then answered in the form of an appropriate quotation from the Bible. Microsoft might consider this as an artificial intelligence shell for MS OS/2 and call it "Ask Gates." Amen.

Scannell is a *Computerworld* senior editor, microcomputing.

Storage for power users

BY JAMES A. MARTIN
CW STAFF

COLORADO SPRINGS — For conventional users it is clearly overkill, but for storage-hungry applications, a 1.2G-byte optical drive from Information Storage, Inc. may be just the ticket.

Information Storage last week announced what it said is the first 5¼-in., 1.2G-byte write-once read-many (WORM) optical storage system for internal mounting in IBM Personal Computers, PC XTs, ATs and compatibles.

The $5,988 system, available now, comes with a drive, a controller, software and cables and boasts a data transfer rate of 6.5M bit/sec., rivaling the perfomance of magnetic media, the vendor said. The WORM drive is said to read 20M bytes of data in 40 seconds and write 20M bytes in less than two minutes.

Although the disk storage is not erasable, as a magnetic hard disk is, the system supports all Microsoft Corp. MS-DOS functions, Information Storage said. The firm's Transparent Optical Software (TOS) is implemented into drive-controller firmware, which causes MS-DOS to view the optical disk as just another hard disk drive.

"Our WORM TOS follows standard protocols, looks erasable and uses simple host-interface software," said Steve Popovich, Information Storage's president.

Compared with traditional hard disk systems, optical WORM drives are said to offer higher capacity and improved data integrity for on-line backup and archiving applications.

An external mount version is priced at $6,188. A small computer systems interface option is slated to be available in August at a cost of about $400.

Information Storage's WORM drive is available in a dual-drive 5¼-in. configuration for $9,488. In addition, the company dropped the prices on its 230M-byte WORM internal mount systems from $3,595 to $1,888 and on its external subsystem from $3,995 to $2,088.

V/SEG stretches the capabilities of your VM DCSS system, not your system programmers.

PROFS...SAS...APL...GDDM...ORACLE...FOCUS. More and more of today's important VM products require Discontiguous Saved Segment (DCSS) facilities.

Yet because of DCSS's singular lack of flexibility —installing, testing, maintaining, and managing products in DCSS is complicated, time consuming, and often results in costly errors. In addition, even small changes require a SYSGEN. And service outages and IPLs are a fact of life.

That is, until now.

Introducing V/SEG from VM Systems Group—the first DCSS manager that stretches the capabilities of your VM system, not your overtaxed system programming staff. You can count on V/SEG for:

DYNAMIC UPDATE

1

Install DCSS-resident software in as little as 15 minutes with no service outages.

Tired of having your programming staff spend hours on each DCSS product installation or update?

V/SEG's Dynamic Update feature not only simplifies the installation and maintenance of DCSS-resident software, it also lets you update on the fly with no IPLs and no need to schedule weekend service outages.

ALIAS ASSIGNMENT

2

Test new software releases without having to shut down your current production version of the product.

Have you ever compromised new software testing because DCSS are so uncompromising?

V/SEG's Alias Assignment feature provides a DCSS renaming capability that allows you to thoroughly test new software releases in parallel with your full production versions—something that is normally impossible with DCSS-resident programs. Not only that, but most testing is transparent to the users and faulty versions can be easily backed out while corrections are made.

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3

Prevent an overlapping of DCSS in virtual memory.

Would you like to decrease the time spent planning and managing DCSS definitions while increasing user satisfaction?

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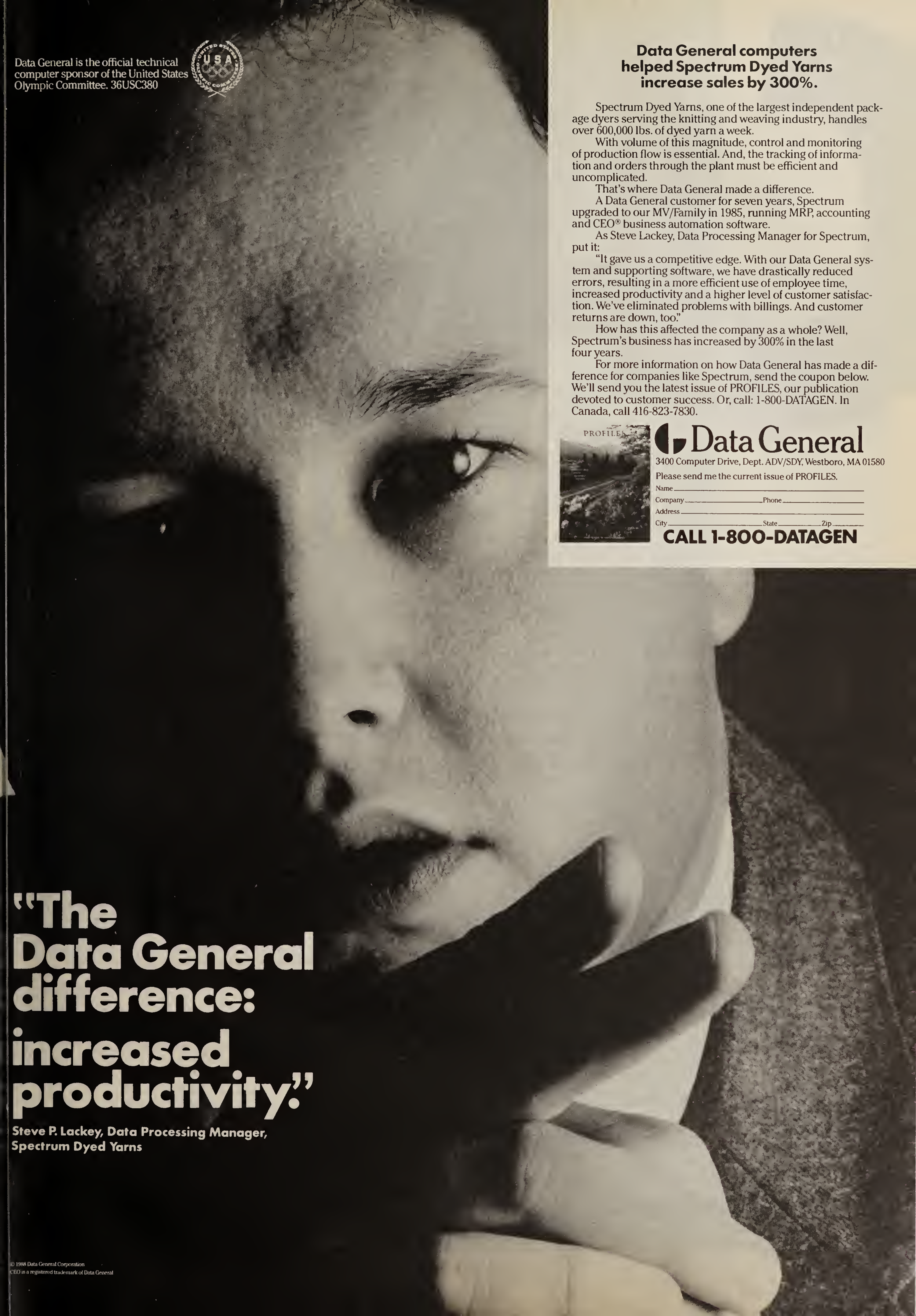

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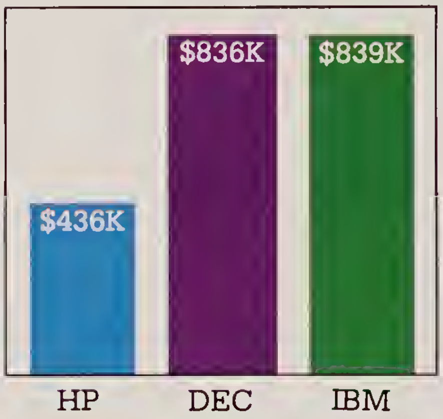

Because the HP 3000 Series 950 costs about half of IBM's 4381-23 or DEC's VAX 8700.

For a comparable class of computer.

Remarkable savings, you'll agree. Savings made possible by HP's remarkable new RISC-based Precision Architecture computers.

RISC—Reduced Instruction Set Computing—is a new concept in designing computers which, through simplification, can speed up computer processing.

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It all means fewer components.

And it all results in significant benefits in terms of reliability, as well as cost-of-ownership and performance.

Benefits which both the HP 3000 and HP 9000 lines will maintain in future models.

To keep on giving you a lot more for a lot less.

The powerful HP 3000 Series 950: one of a full line of compatible mid-range computers.

You'd have true multi-vendor connectivity.

We know you want more networking options, not less.

Hence the HP commitment to a networking strategy that gives you the true multi-vendor connectivity that proprietary networks simply can't deliver.

HP AdvanceNet.

A strategy which adheres to industry standards.

And which supports de facto standards such as SNA.

For example, HP AdvanceNet is based on the OSI seven-layer model. Our HP StarLAN office networking is based on IEEE 802.3. Our networks of UNIX™-based engineering workstations support ARPA/Berkeley services. And our X.25 Private Wide Area Network is based on CCITT standards.

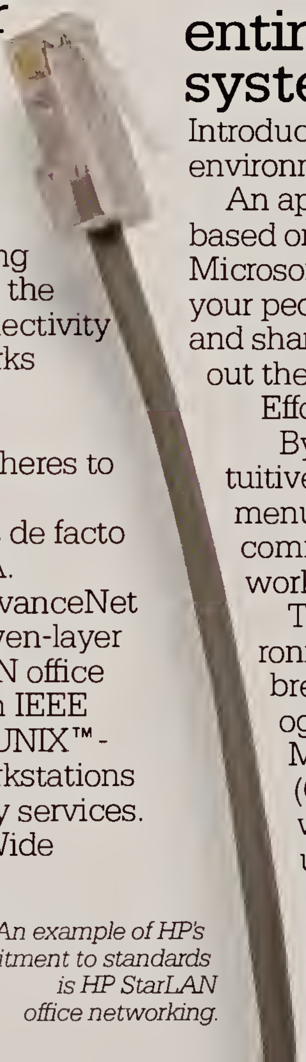
It's this commitment to true multi-vendor networking that will allow you to keep your networking options open in the future, and will protect your existing systems investment.

It's a long-standing commitment supported by years of experience (over 60,000 nodes installed since 1971).

It's a commitment that extends to service and support.

From planning through maintenance. With proven services designed expressly for your multi-vendor network.

Because that's the real world.



An example of HP's commitment to standards is HP StarLAN office networking.

You'd have easy access to your entire information system.

Introducing the HP NewWave environment.

An application environment based on MS™-DOS and Microsoft® Windows 2.0 that lets your people access, manipulate and share information throughout the system.

Effortlessly.

By means of simple, intuitive icons. Pull-down menus. A "mouse." And a common interface across workstation applications.

The NewWave environment incorporates two breakthrough technologies, the HP Object-Management Facility (OMF), and "agents," which together allow users to focus on their business tasks, not their computing tools.

OMF enables users to combine and manip-

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*Based on U.S. list prices available as of December 1, 1987
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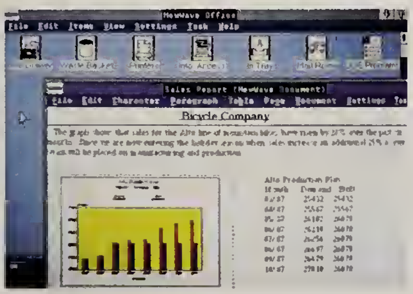
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A window to your world.

ulate different data forms— text, spreadsheets, graphics, images, even voice—from disparate sources throughout the system.

All as easily as if working in a single application.

Then, just as easily, the results can be mailed to anyone on the system.

And in the NewWave environment even the novice user can be more productive.

HP integrated workstations with the NewWave environment.

What's more, "agents," which are practical implementations of artificial intelligence principles, can learn and perform repetitive tasks for your users. For example, "agents" can automatically update and distribute a sales report. On a prescribed day, at a certain time.

Furthermore, the NewWave environment will run under OS/2, when available, and provide future support for MIT's X-Window System™ and Microsoft's Presentation Manager.

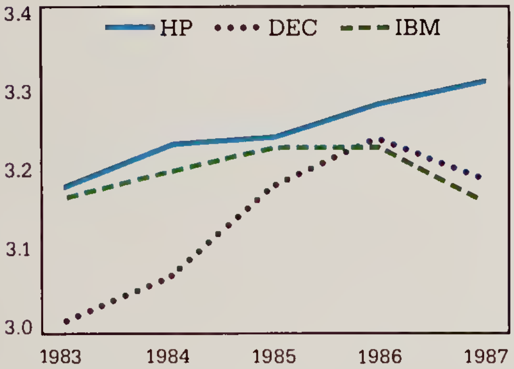
It will lead the way to a new and more productive era in computing.

You'd have the company with top ratings in customer support satisfaction

No two customers are the same.

This is a guiding principle of the HP way of doing business.

Customer Support Satisfaction.



It means asking a lot of "What if..." questions so that solutions can be tailored to your specific needs.

Instead of off-the-shelf solutions routinely handed out.

And it means following up with service and support.

Consider this record: #1 for five straight years in the widely-respected Datapro customer surveys.

It's a record based on an average across six key service and support categories: maintenance effectiveness, maintenance responsiveness, troubleshooting, documentation, education and software support.

And it's a record that should come as no surprise.

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DATA STREAM

Thomas L. Nolle

Mid-range gets SNA

The trouble with big hardware announcements, especially from IBM, is that they often overshadow ılly meaty things that happen the same time.

Look at the fanfare given M's introduction of the 3745 mmunications processor in ıuary. Sure, it's an important oduct; but the software anuncements IBM made at the me time could have a far eater impact on the way IBM d-range systems communite.

Indeed, those packages uld provide a viable way into M's Systems Network Archicture mainstream for Sysm/36s linked via Low Entry etworking, an SNA-based arıitecture that provides peer-peer communications using e PU2.1 protocol. This, in rn, addresses a long-standing ser criticism of IBM's Sysm/36 and 38 series: that it is a averick computer line that ill never fit into — or provide a igration path to — IBM's oth- computer and communicaons architectures.

Under old SNA rules, even ıe smart mid-range processors, ılled PU2.1 nodes, had a limitd ability, at best, to communiıte with each other over an NA network without host inervention. Under the new ules articulated in the recently nnounced Network Control

Continued on page 60

Tymnet throws weight into system integration

BY KATHY CHIN LEONG
CW STAFF

SAN JOSE — In a dramatic departure from its mainstream packet-switching products and services, Tymnet, McDonnell Douglas Network Systems Co. plans to announce today its intent to become a full-fledged systems integrator within five years.

In a separate announcement, the company unveiled two enhanced mid-range packet switches said to offer three times the throughput of older Tymnet models.

The packet switch vendor started its move toward systems integration last year, when it inked development and reseller agreements for T1 multiplexers with Digital Communications Associates, Inc. (DCA); private-line voice-expansion module vendor Republic Telcom Systems Corp.; and data private branch exchange (PBX) vendor Gandalf Data, Inc. The goal of these and future partnerships is to merge other vendors' products with Tymnet packet offerings to provide a single network that someday will support voice, data and video, Tymnet said.

One-stop shopping

The company expects to announce several more alliances with local-area network, PBX or facsimile machine vendors later this year, according to Tymnet's manager of product marketing, Rick Sprinkle. Tymnet plans to leverage these relationships in an effort to become a one-stop communications shop, targeting what it perceives as a growing demand for voice/data integration among its users.

Continued on page 61

Ottinger on-line

DCA president outlines game plan for OS/2

DCA's Ottinger

Amid the popping of flashbulbs and the shaking of hands, the run for the roses to provide OS/2 local-area network connectivity received another important player last Monday when Digital Communications Associates, Inc. (DCA) announced Select CS, an OS/2-based micro-to-mainframe communications server, and an agreement to license and sell Microsoft Corp. and 3Com Corp.'s LAN Manager.

Computerworld staff writer James Daly talked with DCA President James Ottinger on the day of the announcement regarding DCA's plans for the new product as well as future OS/2 connectivity directions.

How involved was Microsoft in the development of Select CS?

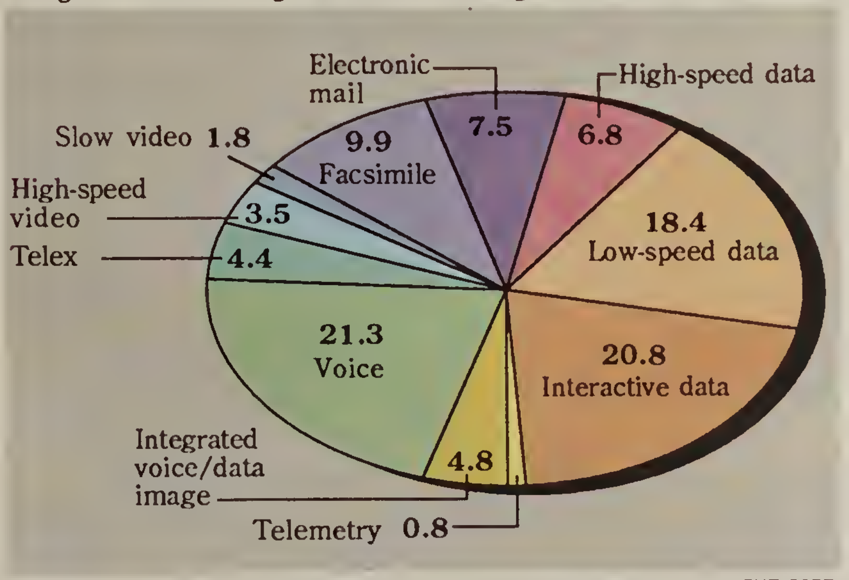
The product development was strictly a DCA responsibility. However, Microsoft worked with us in terms of understanding the specifications. We've had a relationship with Microsoft for quite a long time. We both came to the same conclusion that there was a need for a communications server-based product that took advantage of the advanced features of the LAN Manager and OS/2. There was a

Continued on page 64

Data View

Users' ISDN plans

A correlation of priorities for migrating existing applications to Integrated Services Digital Network, averaged across 600 respondents



INFORMATION PROVIDED BY VENTURE DEVELOPMENT CORP.

TCP/IP net management converges

BY JAMES DALY
CW STAFF

A major obstacle on the path to Transmission Control Protocol/Internet Protocol (TCP/IP) standards was recently cleared when advocates of three proposed TCP/IP network management protocols ironed out their differences and agreed to a unified approach.

After nearly a year of dickering, the TCP/IP Network Management Task Force tentatively decided to use a design based on the Simple Gateway Monitoring Protocol, which has been renamed Simple Network Monitoring Protocol (SNMP).

"With SNMP, the emphasis is on simple; meaning, let's do something in a hurry to put this fire out," said Judy Estrin, vice-presdent of 3Com Corp. and general manager of Bridge Communications, Inc.

SNMP provides a subset of

Continued on page 61

Inside

- Symplex devices direct more traffic over leased-line channels. Page 61.
- Tolerant Systems supports X.25, hooks up to packet-switched nets. Page 68.

Modems, Multiplexers, and Much More...

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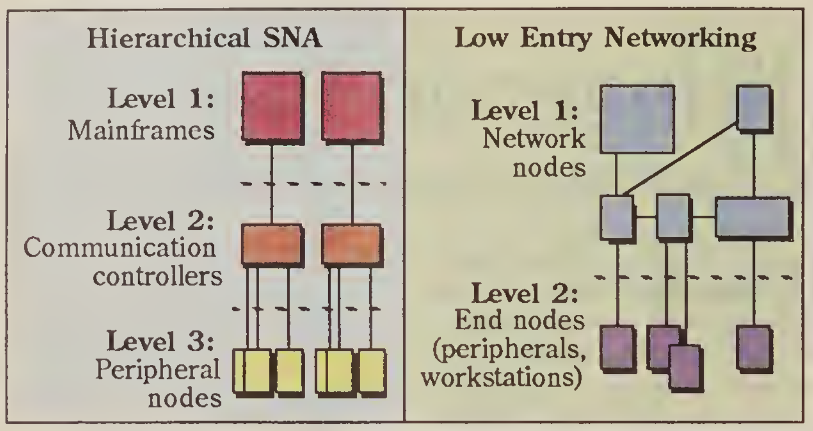
IBM's SNA: Old and new

Hierarchical Systems Network Architecture dictated that master-slave sessions be set up through a host, but Low Entry Networking lets peer nodes communicate without host intervention


Hierarchical SNA
Level 1: Mainframes
Level 2: Communication controllers
Level 3: Peripheral nodes
Low Entry Networking
Level 1: Network nodes
Level 2: End nodes (peripherals, workstations)

INFORMATION PROVIDED BY ARCHITECTURE TECHNOLOGY CORP.

Nolle

FROM PAGE 59

Program (NCP) Versions 4 and 5, SNA peripheral nodes of the PU2.1 class can communicate through intermediary PU2.1 nodes or over an SNA backbone of communications processors such as IBM's 3745 or 3725.

This ability allows System/36s and 38s to communicate over an SNA network using IBM's Advanced Peer-to-Peer Networking (APPN), one of the earliest low-end networking offerings to be released by IBM. The peer communication that PU2.1-based APPN allows can still take place without host involvement, even within SNA.

Another useful enhancement that IBM released with the latest NCP versions is the ability to dynamically update configuration and capabilities tables in an SNA network. This eliminates the need to update NCP tables every time there is a change in a PU2.1 node's logical makeup — for example, the number and type of devices connected to a System/36.

The new release of NCP for SNA controllers also extends the independence of logical units under the control of these peripheral mid-range system nodes. Independent logical units can operate without establishing sessions with the Systems Services Control Point (SSCP) — that is, the mainframe host. And in multihost networks, SSCP ownership of a node can shift without destroying the sessions in progress.

Life after host

All this makes the SNA network using mid-range systems as PU2.1 nodes, or small subarea hosts like IBM 9370s, able to survive the loss of a host.

By building host-independent networking into SNA through the PU2.1 protocol, IBM is making a place for its mid-range systems in the SNA mainstream — and potentially in its Systems Application Architecture (SAA), as well.

IBM has been working hard to develop consistent application programming interfaces for key SNA elements, such as LU6.2, so that programs developed for SNA can run on and communicate across all three system levels: microcomputer, mid-range and mainframe.

This standardization under the SAA umbrella is the key to the closing of the mid-range loophole IBM opened with its nonstandard System/36 and 38 architecture. It also makes the System/36 and 38 line far more palatable to users who want a mid-range system that can function as a liaison between workstation and mainframe architectures.

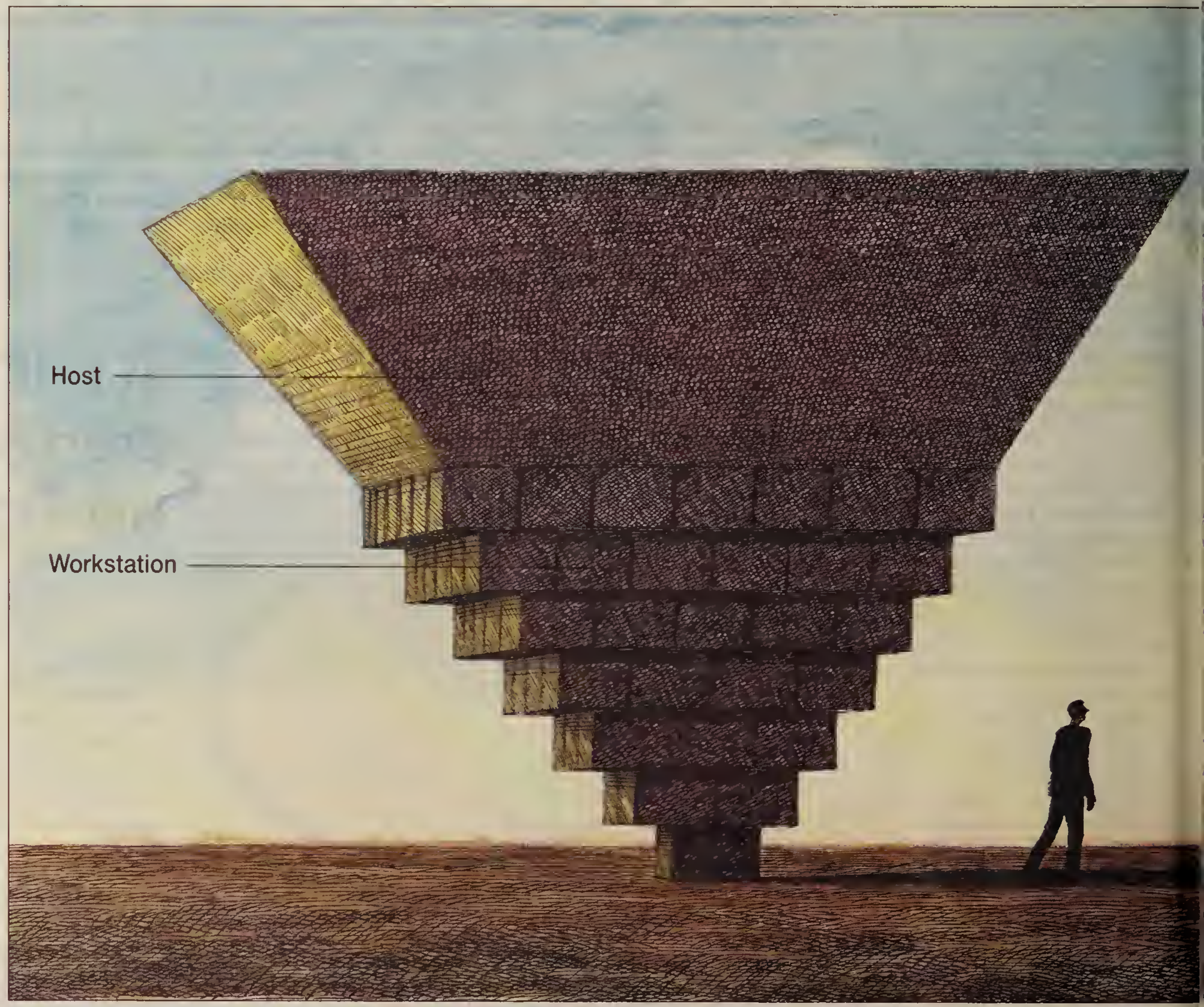
Some have high hopes that IBM will provide better integration through Silverlake — its long-awaited hybridization of the System/36 and 38. But with tens of thousands of this mid-range line installed, IBM cannot introduce an architecture too divergent from the old; that would simply strand a different group of users at a different place in their development path.

On the other hand, IBM can do much on the software and communications fronts to integrate the mid-range line with its other mainline computer architectures. Through SAA, the System/36 and 38 gain application mobility; through SNA's Low Entry Networking, the series could assume a viable, useful role in IBM's distributed processing strategy.

IBM is working hard to fit its mid-range line into the SNA mainstream — to evolve SNA into a networking architecture that can effectively support a peer-to-peer network of mid-range systems as well as a hierarchical host network. This aspect of IBM's January announcements really deserves the most hoopla and bears close watching.

Nolle is president of Haddonfield, N.J., research company CIMI Corp.

Nixdorf. The alternative to the upside-dow



Nixdorf builds its system on a solid base from the ground up. Because the alternative is mighty unstable.

Most computer companies start with the host, then attempt to bring the awesome power of the mainframe down towards the workstation level.

In theory, this approach should work. In actual practice, it falls short, for the same reason one does not slosh water from a bucket into a drinking glass – it's almost impossible to fill the glass more than half full, and you get water all over the table.

Nixdorf takes the opposite approach. We begin at the workstation level, where all the actual work is done, and work up to the existing host via a powerful Nixdorf 8860, 8870, or Targon® server. Thi ensures that all the power in the computer system is usable power, and that none gets wasted in inefficient transmission.

There's another important benefit: The Nixdorf so lution is oriented to delivering maximum informatio and processing power to the ultimate user at workstation level. It is thus no longer necessary to leave it

Tymnet

FROM PAGE 59

"We might have missed out on some bids because we only had a data solution. We have a small part in the Federal Telecommunications System 2000, but it could have been bigger if we had had a total package," Sprinkle said.

'Two levels'

There will be two levels of integration for Tymnet. One is with our strategic partners, and the other is through our network management interfaces," Sprinkle commented.

Tymnet sources said the company is working on a network management system that will run on a Unix-based workstation and support IBM's Netview and, later, the ISO's Open Systems Interconnect protocols.

Tymnet's formal network management announcement is expected in June at the International Communications Association's users show in Anaheim, Calif. The tool will monitor devices from Tymnet, Gandalf, Republic Telcom and DCA, company sources said.

Tymnet's long-term systems integration plans will not supersede its current packet switch business, Sprinkle stressed.

Tymnet also introduced two enhanced mid-range switches, the Mini Engine XL and the Dual Mini Engine XL, said to offer three times the throughput of the original XL models. The Mini Engine XL is priced from $35,000 to $45,000. The Dual Mini incorporates two Mini Engine XLs in one cabinet and is priced from $65,000 to $80,000. The key difference between the new XLs and the original models is the speed. There is 1M byte of memory and three times the throughput in the new line, Sprinkle said.

Symplex boosts line traffic

ANN ARBOR, Mich. — Symplex, Inc. recently introduced several communications devices said to use data compression to significantly increase the amount of traffic that can be sent over a given leased-line channel.

The Datamizer II SDC-5664A provides a data compression ratio of 2-to-1, allowing up to four 64K bit/sec. devices to share a single 64K bit/sec. leased line, Symplex said.

The product enables one 64K bit/sec. leased-line channel to support the output of up to four NE-64 card sets, each of which supports rates of 2.4K to 64K bit/sec. This allows a company to support its data traffic using fewer 56K or 64K bit/sec. lines, which typically cost $2.50 to $5.00 per mile per month, according to Symplex.

The SDC-5664 supports both V.35 and RS-232/V.24 interfaces and up to 24 ports. NE-64 cards share the device with the older NE-4 and NE-1 card sets. Each NE-64 costs $7,950. The system is available immediately.

Symplex also announced the Quantum Plus series of leased-line modems, which double the throughput of data circuits and continuously monitor circuit conditions, compensating for fluctuations in line quality, the vendor said.

The modems' Automatic Link Intelligence function continuously analyzes a transmission line's actual bit error rate, allowing the device to anticipate and compensate for a major line degradation or failure, Symplex said.

Quantum Plus can adjust transmission speeds and packet sizes as line quality degrades and can grant priority to critical applications. Quantum Plus 28.8 is said to double the effective throughput of a 14.4 bit/sec. leased line and employs Trellis Encoding forward error correction. It costs $9,950. Quantum Plus 19.2 increases throughput of a 9.6K bit/sec. line to 19.2K bit/sec. and costs $7,450.

Both models accept input simultaneously from up to four channels of differing speeds. They are available immediately.

TCP/IP

FROM PAGE 59

the functionality needed for full-scale network management, focusing on the routers or gateways that allow data to be passed between separate or dissimilar networks, Estrin said.

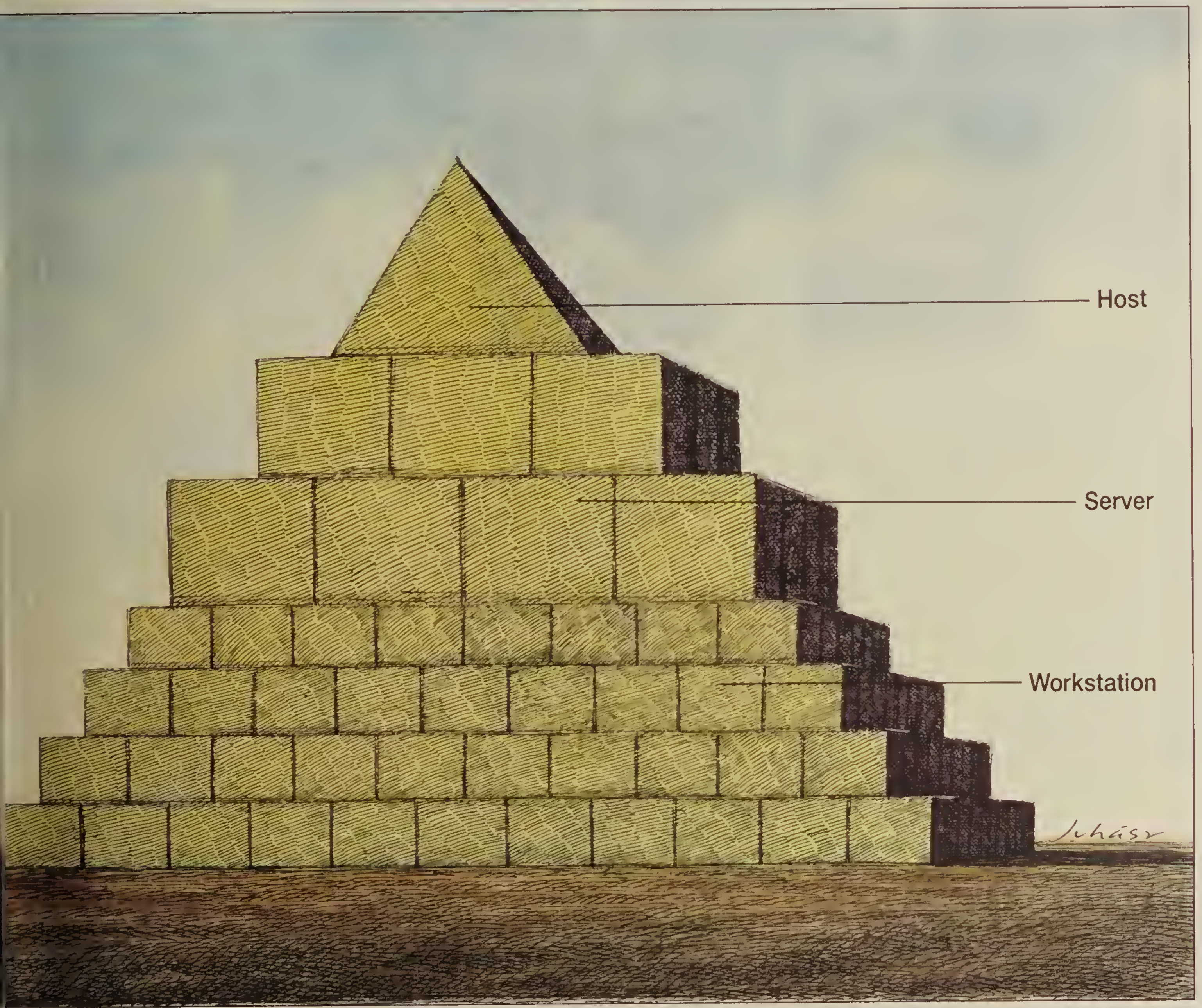
SNMP subsequently will be melded into Common Management Information Protocol, the protocol used in the ISO's still-embryonic Open Systems Interconnect (OSI) standards for network management.

Advocates of the High-Level Entity Monitoring Protocol withdrew their plan.

"This is a very significant agreement in that it maps out a clear migration path for vendors who are interested in developing TCP/IP products today and moving to an OSI architecture in the future," Estrin added.

TCP/IP is a set of multivendor networking standards that has become a de facto standard for a growing number of companies, particularly for the Department of Defense and the engineering and scientific sectors.

olution.



to a "priestly class" of professional intercessors to decide how isolated company executives may use the system. Data need be entered only once, and the system is fully accessible to all workers, allowing them to be creative, and to share their work product, when appropriate, with every other member of the organization, providing maximum synergy.

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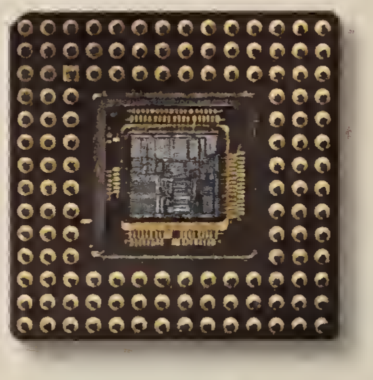

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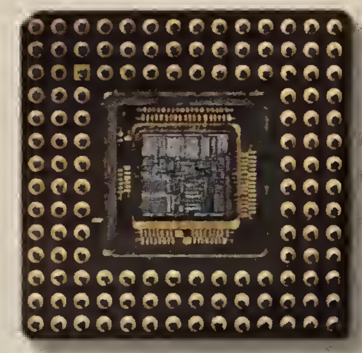

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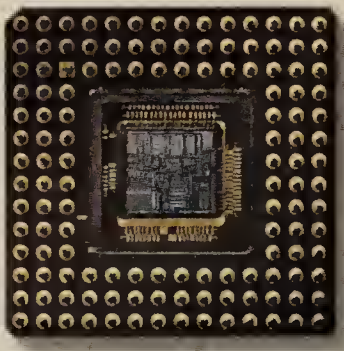
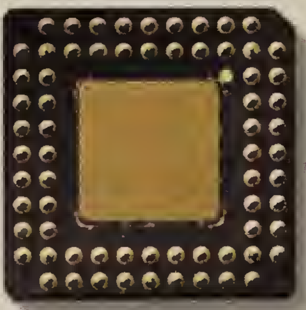


Intel® 80386-16

Intel® 80286-12



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Similar performance enhancements are engineered into each subsystem of every COMPAQ personal computer. Each component is then optimized individually, yet designed to work as part of the total system.

For instance, COMPAQ Fixed Disk Drives deliver both high capacity and high performance. You can install up to a 300-megabyte fixed disk drive in the COMPAQ DESKPRO 386/20 and up to a 100-megabyte drive in the COMPAQ PORTABLE 386. More importantly, you can get to that data almost instantly thanks to some of the industry's fastest access times—averaging less than 30 milliseconds. When you combine this speed and capacity with disk caching, the result is the highest-performance storage subsystem in the industry. To take it one step further, Compaq helps

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FROM PAGE 59

considerable exchange of information.

How different is your product from the LAN Manager?
It's very different. 3Com takes data from the workstation to the server, and we take it from the server to the mainframe, so we're an extension of the LAN Manager. The LAN Manager focuses on intra-LAN things, and what we're focusing on is inter-LAN.

Will current Irma users be able to easily migrate to the new product?
Certainly. In fact, that's one of the beauties of our strategy. As all of our current Irma users move into the OS/2 LAN world, they will need no retraining. A new wire just comes to their desk, and poof — it works the same.

Select CS will not be available until the first quarter of 1989. Why the long delay?
Because of the lack of availability of certain components that have to underpin it.

We need to have the LAN Manager shipping, which will happen in mid-summer, and some of the interfaces aren't completely defined by IBM and other people.

Is it fair to call Select CS an alternative to the Communications Manager?
Functionally it's the same, so it can be called a Communications Manager alternative. But it's packaged very differently.

So why buy Select CS instead of the Communications Manager?
Well, if a user has pieces of hardware that can't run OS/2, they can't run the Communications Manager. Plus, we're packaging on a server base and not on each individual workstation, so it's more cost-effective.

AST Research has also said it will produce a Communications Manager alternative. How confusing will all these options be for users?
If you're a user, you are going to look to companies that are experts at this type of product, because it's not a simple product.

DCA has 600,000 Irma boards, and we are looked at as a de facto standard in micro-to-mainframe communications, and we think this is an evolvement of that.

Will there be support of IBM's Advanced Program-to-Program Communications interface, or APPC?
Yes. APPC, SRPI [IBM's Server-Requester Programming Interface] and HLLAPI [IBM's High-Level Language Application Programming Interface, for micro-to-mainframe links] support will all come with the product.

What role will acquisition plans have in future OS/2 connectivity?
We already have the core technology in-house to take advantage of OS/2 connectivity, so we don't have any acquisition plans relative to OS/2 connectivity. But we think the LAN market will continue to evolve over the next few years, and we'll look for opportunities there.

Does Microsoft's alliance with DCA and its earlier team-up with 3Com Corp. further define Novell as odd man out on the OS/2 connectivity scene?
That's a difficult question. As long as Novell recognizes what interfaces are standard and stays compatible with them, they are not out. It's a matter of developing an OS/2 strategy to support the emerging standards.

What communications directions are you moving in?
[DCA has] a tremendous amount of communications technologies [such as the T1 line of networking products from DCA subsidiary Cohesive]. We're going to bring a lot of those technologies together with Irma and the Crosstalk products to make other products.

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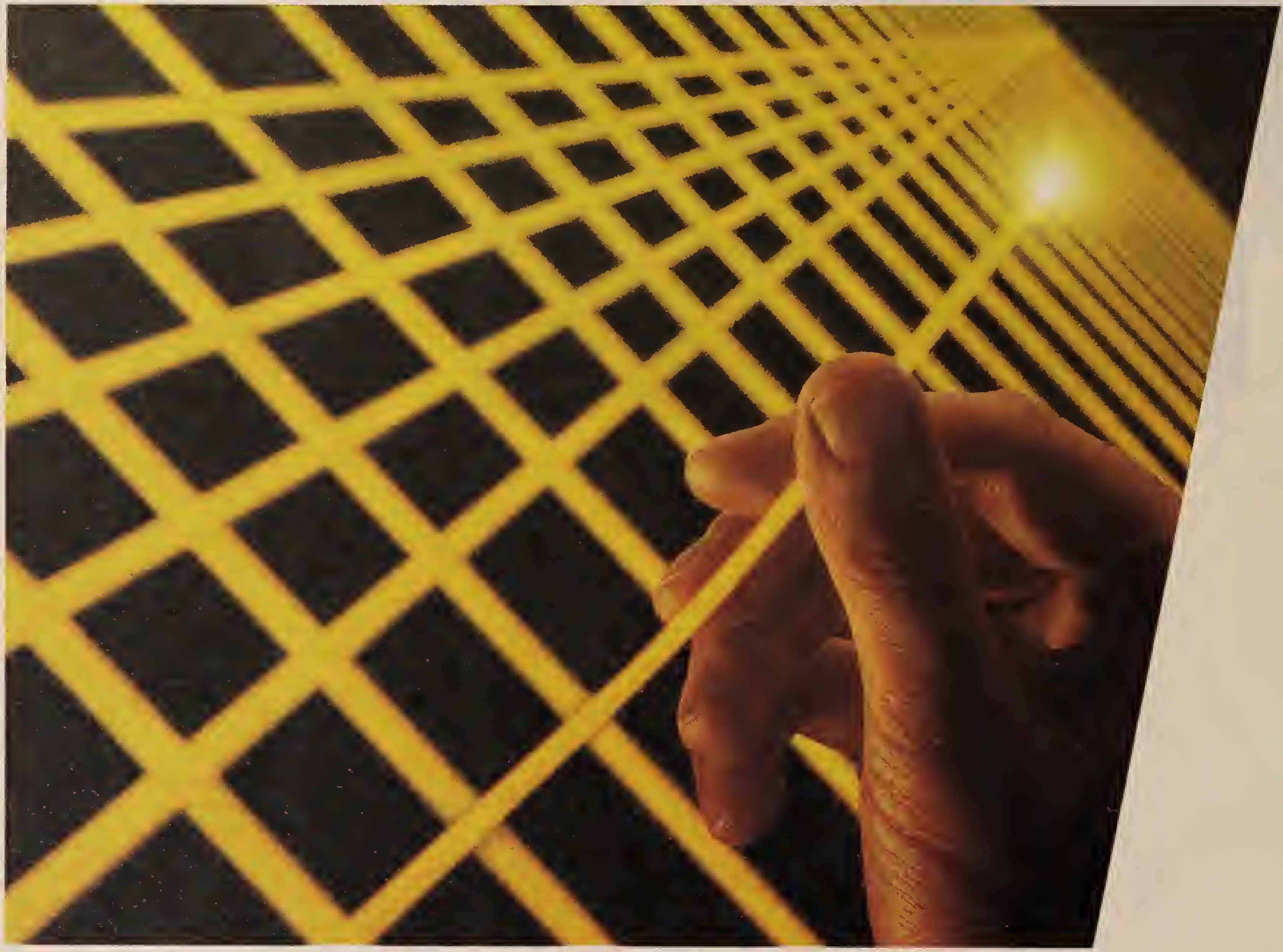

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STRATUS XA2000	4 Processors	36*	$23,100

[1] Based on standardized ETI Benchmark. Results published by FT Systems Newsletter, 1987 ITOM Inter. Co. [2] Audited results published 10/12/87 [3] Using NonStop SQL.™ [4] Prices for systems: Sequoia $929,000; Tandem $995,000; Stratus $830,000.

*Audited results unavailable Numbers based on estimates published in FT Systems Newsletter, ITOM International Co.

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And with the Sequoia Series 200, you can expand your system piece-by-piece, adding processing, memory or I/O modules in any configuration you want. A remarkably cost-effective way to grow as large as you want at your own pace.

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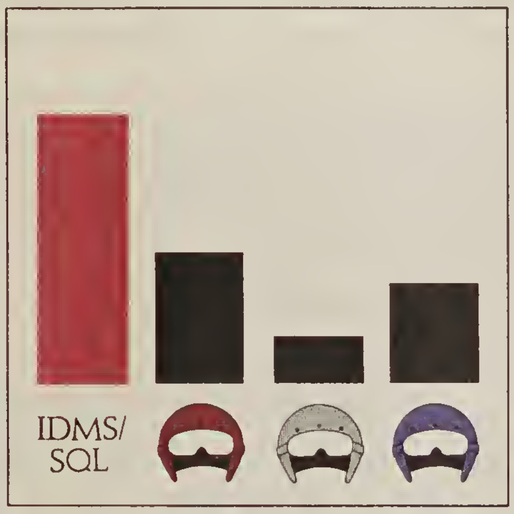

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NEW PRODUCTS

Local-area network hardware

A local-area network transceiver that is compatible with 10M bit/sec. Ethernet Versions 1.0 and 2.0 and IEEE 802.3 specifications has been announced by **TCL, Inc.**

The **Model 2010DM** transceiver offers such features as a switch-selectable 10-MHz heartbeat that is generated by the sending transceiver after each data frame, acting as a signal quality error test and to control collision conditions. A watchdog timer prevents any one terminal from generating continuous transmissions and monopolizing the network.

Prices start at $198.

TCL, 47621 Westinghouse Drive, Fremont, Calif. 94539. 415-657-3800.

An Ethernet terminal server that is compatible with Digital Equipment Corp.'s Local Area Transport (LAT) protocol has been introduced by **Emulex Corp.**

Called the **Performance 4000**, the terminal server plugs directly into DEC's Ethernet network. It is expandable to handle up to 32 terminals at data rates of 19.2K bit/sec. Support is provided for such Decserver features as multiple-host switching, multiple sessions, load balancing, automatic failover and reverse LAT for supporting non-DEC hosts. It features VMS-like command line editing, type ahead and displays.

The Performance 4000 is priced from $3,800.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626. 714-662-5600.

A half card designed to connect up to 32 terminals to an Intel Corp. 80386 Xenix-based system has been introduced by **Corollary, Inc.**

The **Corollary 8x4** multiplexer is a multiple microprocessor I/O subsystem that fits in a half slot. It uses a multiple processor distributed architecture, placing intelligence on both the processor board and a remote eight-channel terminal concentrator unit, the Corollary 8/TC. Up to four Corollary 8/TCs can be connected to the Corollary 8x4 for a total of 32 channels.

A basic kit that supports eight users — expandable to 32 — costs $1,195. It contains the Corollary 8x4 half card, an 8/TC terminal concentrator, Xenix, device drivers and cabling.

Corollary, 18011/E Skypark Circle, Irvine, Calif. 92714. 714-250-4040.

Local-area network software

Western Digital Corp. has announced a local-area network software package based on Novell, Inc.'s ELS Netware 286 Level I LAN operating system.

WD Entry Level Solution (ELS) is a four-user nondedicated Intel Corp. 80286 network system. It allows four active users to share data and resources such as a hard disk, a printer and software. The ELS network operating system is preconfigured for four users, 200 concurrent open files, one spooled parallel printer and one internal hard disk. It can be expanded to support 1,000 concurrent open files, five spooled printers and two internal hard disks.

The WD ELS costs $595.

Western Digital also announced the **WD8000SL Starlan** customized LAN station adapter board for use with Toshiba America, Inc. T3100, T3200/20 and T5100 laptop computers. It costs $299.

Western Digital, 2445 McCabe Way, Irvine, Calif. 92714. 714-863-0102.

Sun Microsystems, Inc. has enhanced its **PC-NFS Network File System** to support IBM Personal System/2 computers.

PC-NFS 3.0, based on the Open Network Computing/Network File System protocol, allows users to transparently share files and resources in a corporate network environment. It offers network support for IBM PS/2s via 3Com Corp.'s Microchannel Ethernet board. When used with Sun's Sunlink products, users can access systems on IBM Systems Network Architecture, CCITT X.25 and Digital Equipment Corp. Decnet networks.

PC-NFS 3.0 costs $395.

Sun also announced **PC-NFS Lifeline**, a network application that provides electronic mail and file backup for personal computers running Sun's PC-NFS. It costs $125 per system.

Sun Microsystems, 2550 Garcia Ave., Mountain View, Calif. 94043. 415-960-1300.

Links

Tolerant Systems, Inc. has announced a software product that supports the CCITT X.25 data communications protocol.

Called **TX.25**, the product is said to allow connection of Tolerant's fault-tolerant computer systems to packet-switched data networks. It consists of an X.25/X.29 interface; a Server for managing X.25 functions; X.3/X.28 packet assembler/disassembler; and the X.UUCP facility for communicating with other Unix systems.

TX.25 is priced at $4,000.

Tolerant, 81 E. Daggett Drive, San Jose, Calif. 95134. 408-292-1688.

Make Your Remote Offices Act Like They're Home.

Far from home, your remote branch offices are struggling to cope with multiple communication lines and multiple communication controllers. On top of all that, they probably want more — like having their PCs networked.

Now Harris has the solution for your dilemma: the 9300 Network Communications System. The Harris 9300 provides your branch offices with access to your central data bases and IBM mainframe applications, while offering PCs all the advantages of NETBIOS-compatible Local Area Networking.

There's no need to purchase separate communication gateways and controllers to provide IBM host connectivity. The Harris 9300 supports the full range of communications with IBM hosts for PCs and 3270 terminals.

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If you're interested in making your remote branch offices act like they're home, the Harris 9300 is the best solution when you require any combination of the following:

- 3270 host application or data-base access;
- Remote printing (RJE);
- PC connectivity.

For more information write Harris Corporation, Data Communications Division, 16001 Dallas Parkway, P.O. Box 809022, MS # 5, Dallas, Texas 75380-9022. Or call toll-free:

1-800-4-HARRIS
Ext. 5004

A voice gateway system designed to provide direct access to any computer-resident information via a Touch-Tone telephone has been introduced by **Speech Plus, Inc.**

The text-to-speech output capability allows the **Calltext Voice Gateway System** to convert data base information into voice for appropriate responses to queries. The digitized voice capability enables the recording of a caller's reply. The system can be expanded from four to 32 lines. Each line can run a different application, and multiple host computers can be accessed simultaneously.

The product includes menu-driven application generation tools and a script language for implementing voice output. It is priced from $31,650.

Speech Plus, P.O. Box 7461, Mountain View, Calif. 94039. 415-964-7023.

Protocol converters

The **PSX/MPP**, a four-port communications coprocessor for IBM Personal Computers, has been announced by **Franklin Telecom.**

The PSX/MPP allows terminal devices to be attached to the coprocessor and switched to any host computer. Up to four units can be installed at one time. Eleven protocols are supported, including CCITT X.25/High-Level Data Link Control, IBM's Systems Network Architecture/Synchronous Data Link Control, 3270 and 5250 Host and Terminal, Bisynchronous 3270 Host and Terminal, Bisynchronous 3780 RJE, asynchronous and Burroughs Poll/Select Host and Terminal.

PSX/MPP costs $2,995.

Franklin Telecom, 733 Lakefield Road, Westlake Village, Calif. 91361. 805-373-8688.

File servers

Cubix Corp. has introduced a personal computer add-in board designed to turn an IBM Personal Computer AT into a file server for multiple PCs.

Called the **Add-4-PCs**, the product enables multiple users to share data, programs, printers, hard-disk storage and other peripherals. The board contains four PCs, each with 768K bytes of random-access memory. It runs under Novell, Inc.'s Netware. Up to four boards can be added to the AT bus, and more than 20 additional users can be added to the same file server through the use of an expansion chassis, the vendor said.

Add-4-PCs also works with standard ASCII, ANSI or graphics terminals. Terminals are connected using an RS-232 link. RS-422 connections allow distances up to 4,000 ft.

The board costs $2,295.

Cubix, 2800 Lockheed Way, Carson City, Nev. 89706. 702-883-7611.

A multiprotocol communications card has been introduced by **TDT Group, Inc.** for use with its line of connectivity software.

The card is available for the TDT Honeywell, Inc. VIP terminal emulation software and Honeywell gateway software for personal computer communication to Honeywell mainframes. It is also available for Transfile 3780, a bisynchronous file-transfer program and protocol emulator.

Features include a choice of interrupts; a possibility of several hundred base-register addresses; user-selectable direct memory access; and support for asynchronous, bisynchronous, High-Level Data Link Control and Synchronous Data Link Control protocols.

Pricing ranges from $349 to $699.

TDT Group, Suite 902, 444 Brickell Ave., Miami, Fla. 33131. 305-372-9332.

Modems/Multiplexers

A subrate data multiplexer designed to provide a gateway into the service function of AT&T's Digital Data Service (DDS) has been announced by **Teleprocessing Products, Inc.**

The **Model TP-972** accesses the service function either by way of a 56K bit/sec. DDS line or by way of a customer-premise D4 channel bank connected to the service function via T1 Accunet. In addition, the TP-972 allows users to implement high-speed backbone networks in which the low-speed tail circuits have secondary channel information that must be passed through the backbone to the central site.

The basic unit provides support for five subrate channels at up to 9.6K bit/sec. Secondary channel is supported on all subrate channels.

Pricing starts at $3,350.

Teleprocessing Products, Building 7K, 4564 E. Industrial St., Simi Valley, Calif. 93063. 805-522-8147.

A two-channel asynchronous multipoint line driver has been introduced by **Electro Standards Laboratory, Inc.**

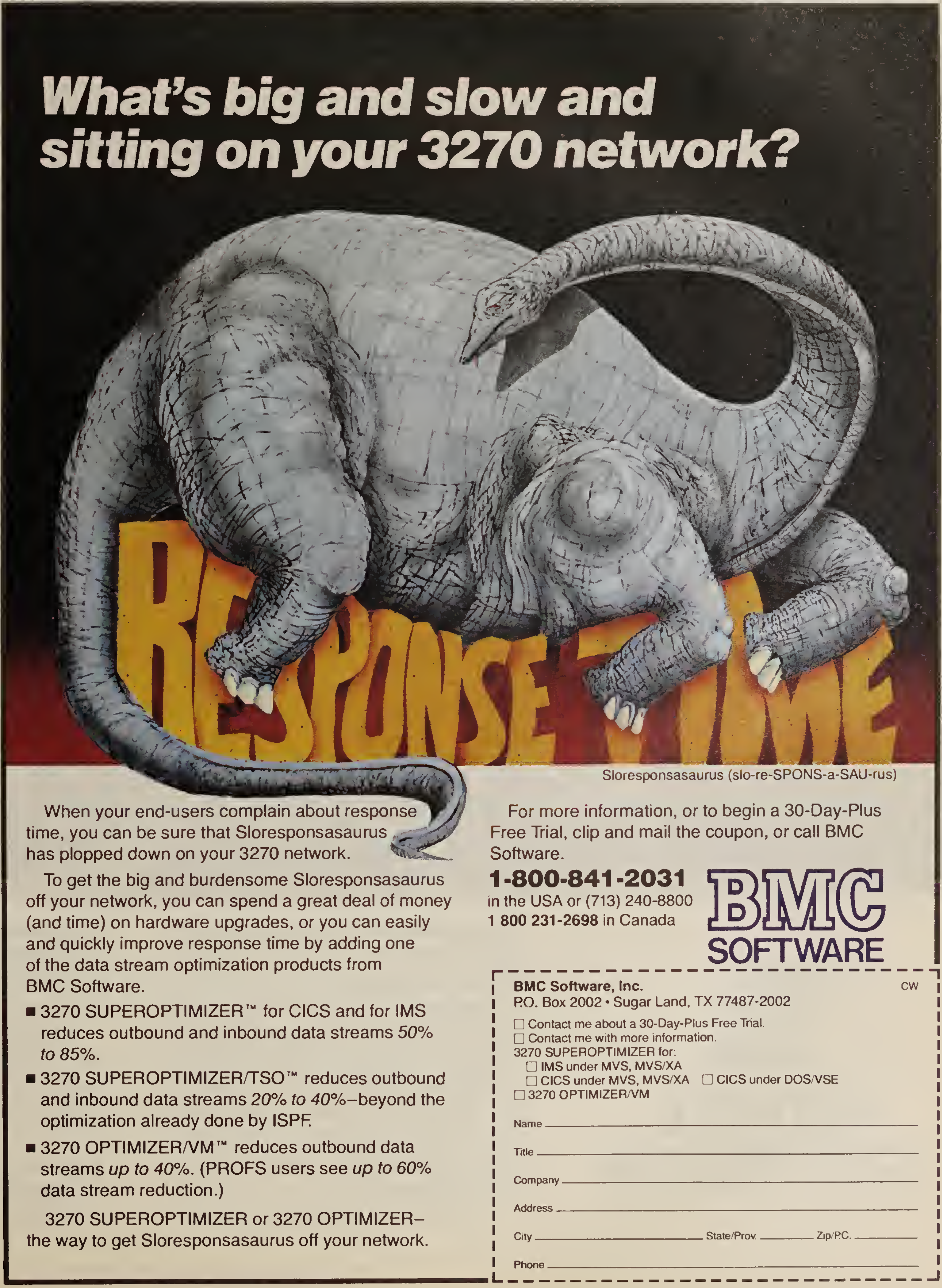
The **Model 4000** unit provides full-duplex transmission over customer-owned four-wire circuits or half-duplex transmission over customer-owned two-wire circuits.

In point-to-point applications, one line driver is required at each end of the link. In multipoint applications, up to 32 drivers can operate over one line.

The Model 4000 is said to be transparent to code, parity and transmission speed. It can operate at data rates up to 40K bit/sec. over one mile of twisted-pair cable. Connection to the unit is via an RS-232 interface.

The two-channel Model 4000 costs $245.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940. 401-943-1164.



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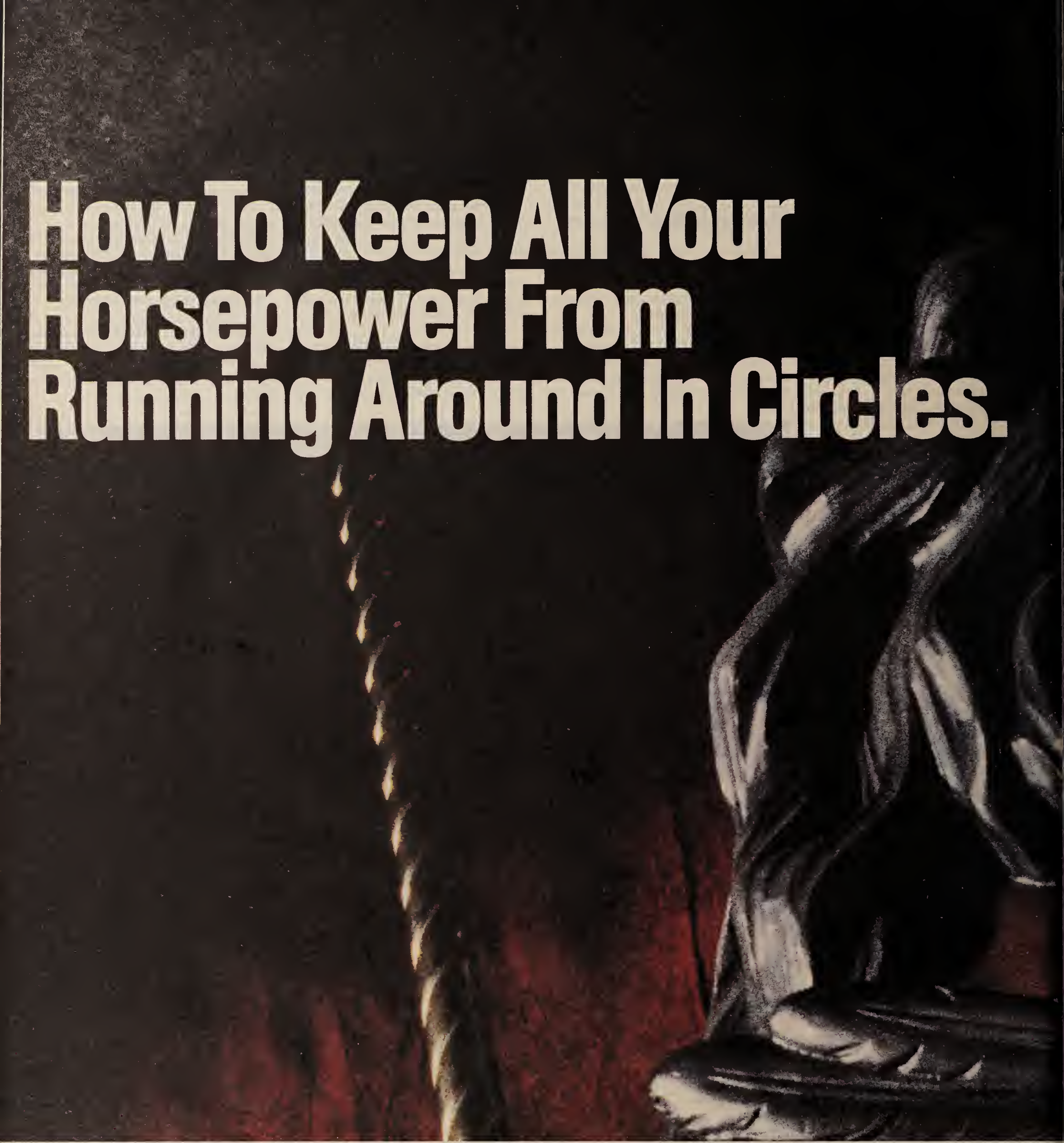

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SYSTEMS & PERIPHERALS

HARD TALK

Jean S. Bozman

High-end roulette

A curious thing has happened during the last few years: IBM and DEC have found out that, in many cases, they have the same large corporate customers.

Until now, DEC President and Chief Executive Officer Ken Olsen has tended to avoid the issue of competing with IBM. So it did not fall on deaf ears when, on March 8, in front of Wall Street analysts and the press, Olsen made it clear that his company intends to push its new VAX 8800 line of peer multiprocessing systems into competition with IBM's mainframe products.

Betting that many large customers are growing tired of the care and feeding of IBM mainframes, Olsen said DEC's appeal with the new VAX 8800 machines will target what he called the "bet-your-business" company. Among such firms are multinationals in the pharmaceutical, manufacturing and aerospace fields, he said, that literally bet their businesses on the information systems they install. Many such customers have vast experience with IBM mainframes, add-on personnel costs and IBM's higher price tags, Olsen suggested.

Sweet deal

To make the case for his competing offering more convincing, Olsen threw in sweeteners formerly reserved for the attache cases of IBM salesmen: six months of on-site software assistance, DEC Solution Packages that preconfigure Vaxclusters and high levels of service after installation.

The largest customers, he said, have come to expect that kind of service from IBM. "We set ourselves to develop the same level of trust with our customers as IBM did," Olsen said. "Our sales force wears dark suits, just like IBM's does. They look like you could trust your business to them."

For years, Olsen has been proposing that the value of a computer lies not in its MIPS or its nameplate but in the actual

Continued on page 74

BASF driven to replace tapes

Cartridge errors traced to lubricant; manufacturer modifies formula

BY STANLEY GIBSON
CW STAFF

Last fall, Andy Gattuso noticed that the tape cartridges for his IBM 3480 had an excessive number of read errors. On examining the cartridges, he discovered white powder on them. A small problem? Hardly. Gattuso, who is manager of computer services at the Cherry Hill, N.J., data center of General Electric Co., has tens of thousands of these tape cartridges in his shop.

After finger pointing between tape vendors and IBM, the drive manufacturer, Gattuso found that the culprit was tape cartridges made by BASF Corp. "They tested a BASF cartridge, and a white substance came out. One pass of the cartridge showed the white powder," Gattuso said, referring to a test run by IBM personnel in his shop. Gattuso is in the process of having all of his approximately 60,000 BASF cartridges replaced at the manufacturer's expense.

The problem was reported at several accounts on the East Coast as well as Gattuso's, according to an industry source familiar with the problem.

In addition, Frederic Sischka, manager of media development at Memorex Corp., said his firm was told of some problems with BASF tapes by some of the Southern California customers that use both BASF and Memorex products. He said he first heard of the problem about 1½ years ago.

John Healion, vice-president of marketing and sales for BASF in Bedford, Mass., said a certain number of BASF cartridges have shown the defect. He said BASF knows the quantity of cartridges, their serial numbers and dates of manufacture, although he declined to disclose that information. He said customers known to have purchased suspect cartridges have been contacted by BASF.

BASF said it has shipped approximately 10 million tape cartridges worldwide, a total that it claims is second only to IBM. All BASF 3480 cartridges are made in Willstaedt, West Germany.

Healion blamed the problem on a combination of temperature change and a larger than usual amount of lubricant in the binder that holds the recording medium — in this case, chromium dioxide — to the tape.

"The shipment was left outside by forwarding people before it was shipped over," Healion said, explaining that the batch was subjected to very cold temperatures and later warmed up to room temperature. "The lubricant was affected by the temperature change and came to the surface," Healion said, describing the lubricant as waxy, rather than powdery.

Gattuso said he was told by BASF that an excessive amount

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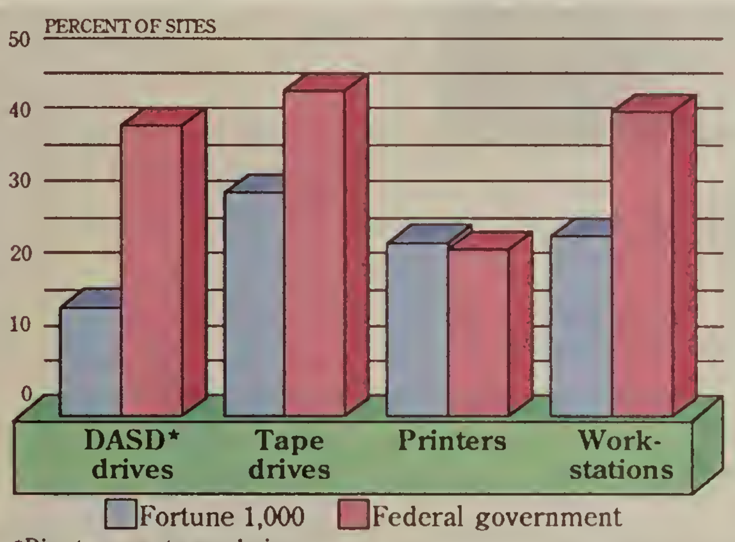
Inside

- Memorex ships IBM-type DASD subsystem. Page 74.
- Decision Data claims printer outperforms IBM's. Page 75.
- Emulex unveils two subsystems. Page 76.

Data View

U.S. goes PCM

Plug-compatible manufacturers find homes in federal government easier than private sector



*Direct-access storage device

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

Chilly CPUs seen wave of future

BY J. A. SAVAGE
CW STAFF

In their continuing battle of size and speed one-upmanship with IBM, manufacturers of IBM plug-compatible equipment say they are looking closely at designs for self-contained liquid-cooled systems for future mainframe generations.

National Advanced Systems (NAS) and Amdahl Corp. have, so far, stuck by air-cooled machines. Their IBM counterparts use external refrigeration units to cool water that is passed to and from the CPU through subfloor plumbing. In the CPU, the water circulates through thermal conduction modules, absorbing heat given off by the CPU's microprocessors.

Neither company will say for certain whether their machines will have internal plumbing. However, with advances in liquid-cooling technology that enable a mainframe to efficiently cool itself like a refrigerator, and with continuing pressures to make smaller and faster machines, the companies say it is a possibility.

"Amdahl can't keep up in the MIPS game without liquid cooling," said Robert Tasker, direc-

Continued on page 75

Raster brings parallel processing to GX4000

BY STANLEY GIBSON
CW STAFF

WESTFORD, Mass. — Raster Technologies, Inc. announced a parallel processing capability for its GX4000 family of graphics accelerators for Sun-3 and Sun-4 workstations.

The GX4000 is a board set that plugs directly into the VME backplane of Sun Microsystems, Inc.'s Sun-3 and Sun-4. The GX4000 uses Programmer's Hierarchical Interactive Graphics Standard (PHIGS) and PHIGS+ as its native command set.

Raster Technologies began shipping single-processor configurations of the GX4000 in the fourth quarter of 1987.

Operating at its peak, the system is capable of up to one million three-dimensional vectors per second and up to 225,000 polygons per second, the vendor claimed.

The parallel option allows a system to be configured with up to eight Graphics Arithmetic Processors (GAP), according to Raster.

The board set consists of four primary components:

- The Display List Memory Unit, consisting of an on-board processor capable of 20 million instructions per second (MIPS) to perform display list memory management and traversal. By performing this task in the GX4000 hardware, the Sun CPU is free to perform other application tasks during real-time graphics updates, Raster officials said.
- GAP, which offers speeds of up to 10 MIPS and 20 million floating-point operations per second. Each GAP delivers the graphics power to process 220,000 3-D vectors and 18,000 Gouraud-shaded polygons per second. Up to eight GAPs operating in parallel can be configured. As GAPS are added, no software changes are necessary, according to the vendor.
- The Image Memory Unit, which contains a frame buffer, video output section and custom very large-scale integration drawing processors operating in parallel. The display resolution is 1,280 by 1,024 by 24 pixels with four additional control planes for overlays and window system management.
- A Z-buffer of 1,280 by 1,024 by 16 bits, which handles depth comparisons.

The GX4000 with multiple GAPs is scheduled to begin shipping in 30 days.

A single GAP is priced beginning at $36,000. Additional processors are priced at $12,000 each.

The vendor said the system will be shown at the National Computer Graphics Association exposition, which is taking place this week in Anaheim, Calif.

Memorex unveils DASD subsystem

BY J. A. SAVAGE
CW STAFF

TULSA, Okla. — Offering a lower price compared with its previous solid-state direct-access storage device (DASD) subsystem, Memorex Telex Computer Products, Inc. recently introduced the 6890 Storage Subsystem.

The solid-state subsystem emulates an IBM 3380 disk drive and a 3880 controller, storing and retrieving data at transfer rates up to 3M byte/sec.

The storage capacity of the subsystem ranges from 16M to 256M bytes, growing in increments of 16M bytes. Each 6890 storage unit can emulate up to eight logical disk volumes, giving a maximum of 32 volumes in the full subsystem. The 6890 can be divided into logical volume capacities as small as 1M byte or as large as 256M bytes.

Separate entities

The 6890 Storage Subsystem is not an upgrade of the company's 6880 DASD product. The earlier 6880 with a minimum configuration of 32M bytes costs about 30% more than the new storage system with equivalent memory, according to the vendor. The 6890 subsystem is offered with a smaller, 16M-byte minimum memory configuration and is housed in a smaller box than its predecessor.

The subsystem must be coupled with the company's 6898 storage control unit. Minimally configured with one control unit, it has 16M bytes of storage and is priced at $67,785. With two control units, 16 I/O channels and four 6890 storage units offering 1.02G bytes of storage, the system costs $213,675.

According to Memorex, the system is compatible with IBM 4300, 3080 and 3090 series and equivalent processors running IBM's MVS/XA, MVS/SP, Unix/UTS, VM/XA and VSE/SP.

Memorex also offers an optional power supply backup feature, and a 4.5M byte/sec. transfer rate is set to be available in the third quarter this year.

Bozman

CONTINUED FROM PAGE 73

amount of work it allows you to accomplish in a day. Olsen has termed this "benchmark" a TAD: transactions accomplished per day. The concept was floated at the time of the VAX 8600 announcement in October 1985 but was given wings with the introduction of the VAX 8800 series. Three years ago, DEC made its first product comparisons with the IBM 3080 processors but couldn't compete with the power of IBM's channel-based architecture.

This month's introduction has changed all that. Now, DEC customers can pick from mainframe-level memories of 128M, 512M or 1G byte. They can choose to run multistreaming applications side by side, just as they would on a mainframe. The critical addition of symmetrical multiprocessing was designed to smooth out computations that might have formed bottlenecks before it came along [CW, March 14]. In contrast with IBM mainframe prices, overall system cost is far less — $543,000 to $1.6 million.

Will all these inducements work on the typical multinational customer who owns both DEC and IBM machines? Based on a quick survey of such companies last week, probably not immediately. Nabisco and United Technologies, to name two, said they plan to use IBM mainframes for financial and administrative tasks and VAXs for shop floor control, distribution and real-time end-user applications.

WILL ALL these inducements work on the typical multinational customer who owns both DEC and IBM machines? Based on a quick survey of such companies last week, probably not immediately.

Even DEC realizes it is more likely to benefit from existing Vaxclusters' getting new tasks than from customers carting their IBM 3090s to the city dump. "We have somewhat different styles of computing," conceded William Demmer, vice-president of mid-range systems at DEC, referring to the way IBM machines and VAXs go about their work. "Our goal is to bring new applications on-line on Vaxclusters and to show that those applications can be accomplished more efficiently with a VAX than with an IBM mainframe."

But in a battle that is counted in TADs, users should stay tuned; DEC has more announcements planned for this year. The VAX 8800 series will be loaded with some high-powered ammunition when DEC adds an on-line transaction processing package. That's the sort of offering that DEC hopes will make its VAXs a realistic choice for mainframe users with high-volume demands.

Then the battle with IBM should really begin to heat up.

Bozman is *Computerworld*'s Midwest correspondent.

PRINTER

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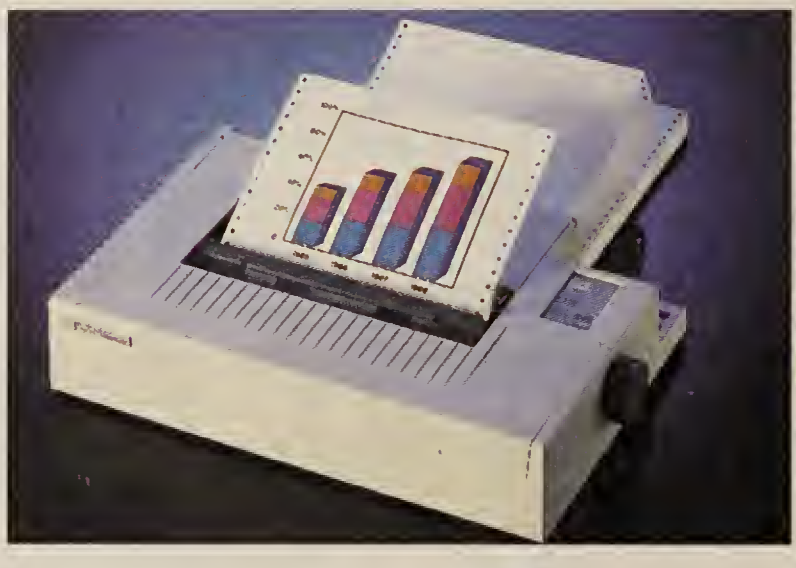

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HEWLETT PACKARD

Printer pitted against IBM

Decision Data boasts of 6815's speed, price advantages

HORSHAM, Pa. — Boasting greater speed and lower cost than is offered by IBM, Decision Data Computer Corp. said it will ship a high-volume, letter-quality printer aimed at IBM System/36 and 38 users this month.

According to the vendor, the 6815 Band Printer is 18% faster, 46% more compact and costs 11% less than the IBM 4245 T14 printer. The Decision Data printer is said to run 1,500 line/min at 48 characters and has a 55 in./sec. skip rate. The unit's footprint is less than one square yard.

The printer has a digital display that enables the unit to make quick verification of font language and paper-handling mode.

The 6815 Band Printer also offers fully formed character sets for up to 30 different fonts, including foreign languages. In addition, it can be run at 64 and 96 char. bit/sec., according to Decision Data.

All the options

The printer has a straight paper path, flat tractor feeds and power paper pullers to reduce misfeeds and jams. It comes with quick release and load for both print bands and ribbons and a five-position adjustable output tray.

The print mechanism is fully enclosed for quiet operation, comes with a built-in vacuum cleaner system and can accept oversized forms up to 17½-in. wide.

The printer is also said to offer self-diagnostic capabilities and a menu-driven setup.

Currently shipping, the 6815 Band Printer is priced at $24,500.

Optimem adds SCSI buffer

MOUNTAIN VIEW, Calif. — Optimem recently enhanced its nonerasable optical disk offerings by announcing the Optimem 1000 6/7 subsystem with a small computer systems interface (SCSI) controller and a 64K-byte data buffer.

The 2.0 SCSI controller is intended to add flexibility by allowing connection of the optical drive to multihost computer systems. It lets users reserve the drive or keep the drive connected to the system until the user releases it and thus reduces contention in multiuser systems, according to Optimem, a subsidiary of Cipher Data Products, Inc. The controller was designed to also improve reliability and reduce power consumption.

The 64K-byte buffer lets the disk spin continuously and reduces latency, Optimem said. The Optimem 1000 6/7 is a write-once read-many system that stores up to 2G bytes of data on removable 12-in. disks. The subsystem costs $13,600. A kit to upgrade an Optimem 1000 1/2 to the Optimem 1000 6/7 costs $2,000.

BASF

CONTINUED FROM PAGE 73

of lubricant was used in the binder that holds the chromium dioxide to the tape.

Healion said the amount of lubricant in those batches of tape was within the limits allowed by manufacturing specifications at that time. But as of October 1987, manufacturing specifications for the amount of lubricant in the mixture were tightened to a narrower tolerance, he said. Healion said after the formula was changed, extensive testing was performed to assure that the new formulation would not be affected by heat, cold and moisture.

However, Memorex's Sischka said he analyzed replacement BASF tape from a data center at the University of California at Los Angeles and found that the lubricant used was totally different from the previous formulation. "They replaced a solid lubricant with a liquid one," he said, adding that better performance can be expected from the liquid type.

Whatever the formulation, and despite the inconvenience and the risk of data loss, the problem is being resolved to his satisfaction, Gattuso said. Approximately 50,000 cartridges have so far been replaced, and the new cartridges give off no powder, he said.

"BASF paid all the expense. They paid for temporary help in relabeling and in initializing the cartridges," Gattuso said, adding that he is pleased with BASF's handling of the problem.

He also said the white substance did not damage the 3480 drives, and no data has been lost as a result. The major difficulty was simply the high number of retrys that were required. Gattuso said he plans to continue purchasing BASF tapes, for which he pays three dollars apiece less than for IBM tapes.

Deja vu

Gattuso's experience recalled difficulties that IBM and Memorex had shortly after IBM's introduction of 3480 tape cartridges a couple of years ago. At that time, both companies had problems with chromium dioxide separating from the binding compound used on those early tapes. A resultant sticky residue gummed up the drive heads.

IBM and Memorex contracted separately with Morton Thiokol, Inc. to develop a new binder that would not decompose in reaction to chromium dioxide. IBM and Morton Thiokol obtained a patent on their new binder formula. The one developed by Memorex and Morton Thiokol was slightly different and has not been patented, according to Sischka.

IBM published its new formula specifications, Sischka said, in order to encourage tape makers to produce problem-free tapes that would lend support to its 3480 hardware standard.

BASF would not say whether it conforms to manufacturing guidelines laid out by IBM. It only said its products are compatible with IBM equipment. Healion said BASF's recent lubricant problem is different from IBM and Memorex's earlier problem. Having analyzed BASF media, Sischka agreed that the two problems are not directly related.

Chilly CPUs

CONTINUED FROM PAGE 73

tor of computer research for the Boston-based market research firm The Yankee Group. With liquid cooling, Tasker estimated that plug-compatible mainframes (PCM) will gain 300 times the cooling ability compared with current air-cooling techniques.

Third party interested

At least one other IBM rival is considering liquid cooling. Digital Equipment Corp., in its drive to challenge IBM on its mainframe turf, is reportedly developing a water-cooled system, code-named Aquarius, according to Stephen Widen, a DEC analyst at International Data Corp. in Framingham, Mass.

The extent to which companies consider liquid cooling is driven by the density of the chips, according to Dennis Stein, manager of processor systems marketing at Amdahl. "The closer you put the chips together, the better performance you get. But the denser the chips, the more heat you get."

The other critical factor in liquid cooling is internal wiring. The I/O components — the bus and cables — must be close to the CPUs in an air-cooled machine for speed and to ensure the integrity of electrical impulses. But close-in wiring hampers efforts to reduce the size of the cabinet. With liquid-cooling, the wiring can be placed farther from the main processors, possibly in another cabinet.

Carl Claunch, director of market planning at NAS, said that in the future, he expects to see the I/O in a separate box connected to the mainframe.

Stein said he envisions a mainframe that may be part air- and part water-cooled, putting the plumbing only in heat-critical areas, such as CPUs.

'Floating target'

Both NAS and Amdahl said there is no specific threshold combination of speed, power and size that would require liquid cooling. "It's a floating target," Stein said.

The decision on which cooling technology to incorporate comes late in the design process because there are constant developments in chip technology, according to Claunch. "The ability to make chips gets better every year. They are either 20% faster or 20% cooler," he said.

The drawback to liquid cooling is the increased risk of leaks. "The engineering guideline is to 'keep it simple,' " Claunch said. Liquid cooling necessitates more parts and an increase in parts also increases the chance that one of them will fail. "If the cooling is interrupted, the components melt," Claunch explained.

A West Coast data center manager in charge of a number of IBM mainframes recalled earlier problems IBM had in inhibiting rust and corrosion in the plumbing when water-cooling was introduced with some 370 series models. Once those difficulties were resolved, however, the manager recalled no failures as a result of the cooling system on any of his mainframes.

In addition, Larry Martin, vice-president of Reliability Research, Inc. in Norwalk, Conn., said that although he has no specific figures on cooling system reliability, cooling system failures have never been discussed by subscribers of the electronic bulletin board his firm runs.

The liquid used in liquid cooling does not have to be water, although Amdahl indicated the company would stick with water instead of other coolants like ammonia or salt-based solutions. NAS, however, indicated that it is leaning toward Freon, the trade name for a group of fluorocarbons used in refrigerators and air conditioners.

Fiber optics play role

One development that may push liquid cooling off into the future is the current move to fiber optics. Both PCMs said they do not want to change more than 30% of their mainframes' technology in a new generation, so it is up in the air which they will implement first, fiber optics or liquid cooling. Fiber-optic filaments are significantly thinner than conventional wires, allowing for a smaller box. They also carry signals much faster.

NAS's XL computer, its largest mainframe, benefits from Teflon-coated wire. "To make signals that must travel at high speed requires exotic wire technology," Claunch said. "Fiber optics is an alternative to exotic wiring, but you have to convert from electric impulse to optical back to electric."

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NEW PRODUCTS

Processors

A 32-bit Unix-based integrated office system departmental processor has been announced by **CPT Corp.**

Called the **Office Dialog System 120** (ODS 120), the computer supports up to 12 directly connected users. According to the vendor, the ODS 120 also provides server support for communication gateways and business applications.

The ODS 120 is system and application compatible with the larger ODS 300, which supports up to 32 users. CPT workstations, IBM Personal Computers or any standard ASCII terminal can interface with an ODS, the vendor said.

The ODS 120 is priced from $25,000, including one 140M-byte disk, 3M bytes of random-access memory, a quarter-in. tape backup drive and 12 serial ports.

CPT, P.O. Box 295, 8100 Mitchell Road, Minneapolis, Minn. 55440. 612-937-8000.

Graphics systems

An image processing workstation called **Nuvision** has been introduced by **Perceptics Corp.**

Features include an integral digital signal processor on each image memory for parallel processing of multiplane images; frame grabs of 1,024- by 1,024-pixel monochrome, red-green-blue true color and stereo pair images in 0.3 sec.; 1,280- by 1,024-pixel 24-bit true color display; an Apple Computer, Inc. Macintosh II workstation; and integrated software for basic display, spatial, Fourier, geometric and morphological processing, including continuous interpolated zoom.

A base system is priced at $17,210.

Perceptics, P.O. Box 22991, Knoxville, Tenn. 37933. 615-966-9200.

Data storage

Emulex Corp. has introduced versions of its removable storage subsystem and embedded micro subsystem with capacities of 760M bytes per module.

The **Emulex Removable Subsystem** (ER2) is now available in a model that connects to Q-bus computers through Emulex's QD21 controller and as a small computer systems interface model that connects to Q-bus, Unibus or IBM Personal Computers.

Both models offer total subsystem capacities to 1.3G bytes.

The **Emulex Micro Subsystem** (EMS) kit provides a similar single- or dual-disk package for use within Digital Equipment Corp.'s MicroPDP-11 or Microvax II World Box or BA23 enclosures, the vendor said.

Prices for the ER2 start at $14,430; the EMS costs from $10,705.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626. 714-662-5600.

A family of **VMEbus data storage and communications products** has been announced by **Emulex Corp.**

The products include two disk controllers, a nine-track tape controller, a small computer systems interface-to-VME host adapter and a 16-line communications controller.

The VM21 and VM31 dual-height disk controllers support up to four enhanced small device interface disk drives with transfer rates to 24 MHz. They cost $1,695 and $2,195, respectively.

The VT01 nine-track tape coupler can control drives with recording densities to 6.2K bit/in. and tape speeds of more than 200 in./sec. It costs $1,395.

The VH01 VME host adapter, which is priced at $1,425, can accommodate single-end or differential drives and a floppy-disk port. The VS02 VME 16-line asynchronous communications multiplexer, priced at $1,400, can support 60,000 char./sec. throughput.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626. 714-662-5600.

Printers/Plotters

A vector-to-raster processor that converts graphics data supplied by host IBM 3274 cluster computer environments into a format suitable for printing has been announced by **Logic Sciences, Inc.**

Called the **Turbograph 700 Series III**, the processor provides IBM 3287 emulation in Systems Network Architecture Control String and 3270 Data Stream character modes. Drawing speeds are up to 400,000 vector/sec. Input memory and raster image memory are expandable to 2M bytes.

The Turbograph 700 Series III costs $9,500.

Logic Sciences, 11000 S. Wilcrest, Houston, Texas 77099. 713-879-0536.

Artisan, an eight-pen plotter said to produce drawings on cut-sheet paper and film, sizes ANSI A to D, at speeds up to 30 in./sec., has been announced by **Calcomp**, a subsidiary of Lockheed Corp.

Features include Calcomp's Plot Manager firmware, a nonvolatile set-up memory that permits up to four users to save such set-up parameters as communications mode, scaling and pen velocity, built-in diagnostics and the Calcomp graphics language interface.

Artisan is priced at $4,895.

Calcomp, P.O. Box 3250, Anaheim, Calif. 92803. 714-821-2142.

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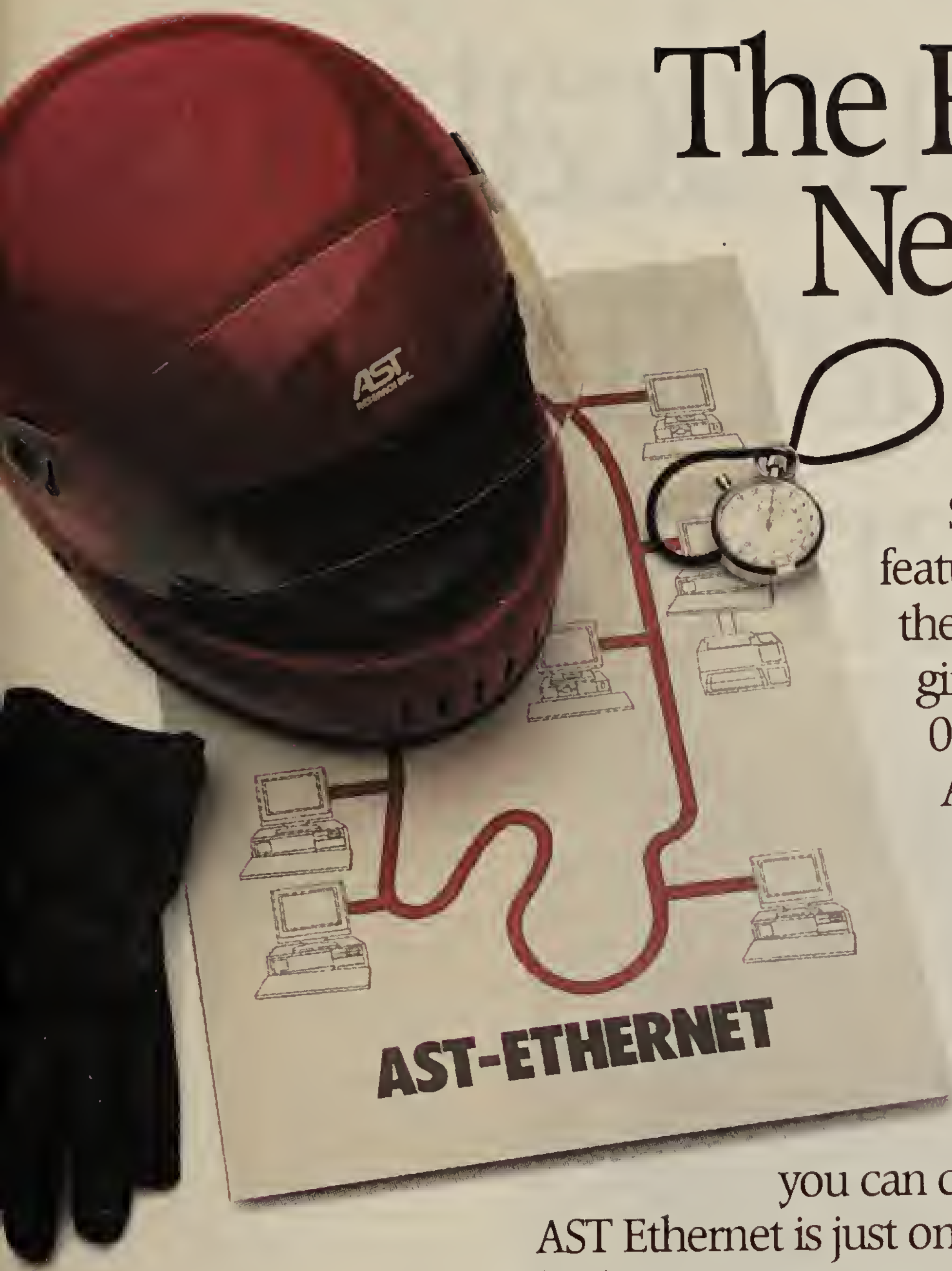

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EXECUTIVE REPORT

MANAGING INTO THE '90s

The restructuring of MIS: Business strategies take hold

BY JOHN KIRKLEY

Although "The First Law of Holes" is invoked far less often than the Peter Principle or Murphy's Law, it's probably more important.

The law simply states, "When you're in one, stop digging." These words of advice should be posted on data center bulletin boards and wherever else MIS professionals are known to congregate.

The hole into which MIS has dug itself through the years is well known: Articles detailing MIS arrogance toward end users, cost overruns, application backlogs and an abundance of jargon-ridden technospeak are commonplace. It's time MIS regrouped.

The MIS function is in the midst of its most significant restructuring since the role began evolving more than 30 years ago. And all bets are on the changes accelerating and becoming even more complex rather than subsiding into a new, clearly defined structure.

Today's MIS managers can no longer use the old paradigms to respond to challenges within their organizations. Instead, successful managers are creating new róles and accepting new responsibilities.

In many cases, managers are making up their job descriptions as they go along in order to cope with constant organizational, technological and managerial change.

"The information systems function will not exist as it's presently constituted," says R. Talmage Fish, manager of information systems at Burlington Industries, Inc., a large textile manufacturer located in Greensboro, N.C.

Fish speaks from experience. He has dealt with the complexities of centralization vs. decentralization, weathered the microcomputer revolution and, most recently, is feeling the impact of the restructuring of the company, the result of a series of unexpected events.

Last September, controlling interest in Burlington Industries was acquired by Wall Street securities firm Morgan Stanley Group, Inc. after the repulsion of a hostile takeover attempt by Dominion Textile, Inc. and corporate raider Asher Edelman.

In the wake of this action came budget cuts, changes in reporting relationships and reshuffling of divisions — all of which changed the function of Burlington's MIS department.

A new mold

Corporate takeovers, mergers, acquisitions and divestitures are all part of today's fluid organizational scene. Information systems have now won their place as a key element in the corporate strategy, a fact that provides new opportunities to and places new pressures on MIS. There are other forces reshaping MIS as well.

First and foremost is the truism that MIS managers can no longer separate themselves from the business in which they work. They can no longer see themselves as just data processing specialists who happen to be applying their trade at an insurance company, bank or airline. Their job now is to support their corporations' financial and strategic goals.

A recent survey of more than 500 MIS executives by The Index Group, Inc. in Cambridge, Mass., shows that the top concerns of senior MIS managers are to bring MIS goals in line with corporate goals, to be involved in more strategic planning and to use information systems to give their company a competitive advantage.

At the same time, the old debate over centralization vs. decentralization rages on, and managers continue to question who will ultimately control networking and telecommunications functions.

Of course, technology continues to be a major factor shaping the future of MIS. In addition to advances in communications, particularly PC LANs, the amount of available millions of instructions per second on the desk top is growing at a staggering rate.

This growth is leading some, like Fred Forman, director of the Corporate Technology Group at American Management Systems, Inc., to express concern

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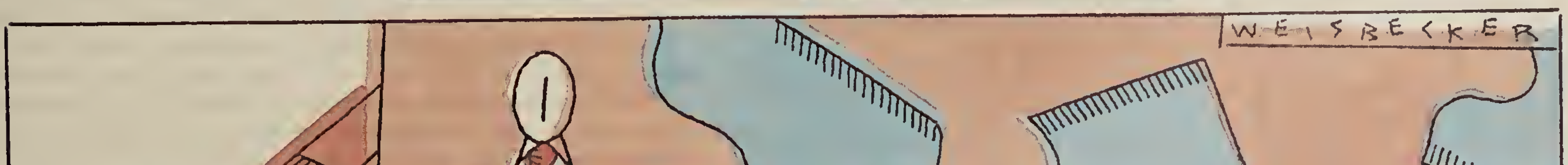
Kirkley is a computer industry writer, editor and consultant based in Warwick, N.Y.



PHILIPPE WEISBECKER

Restructuring

FROM PRECEDING PAGE

about the completeness and accuracy of the information being generated by throngs of personal computer-wielding users — users who may be building data bases and making fundamental business decisions on the basis of flawed or inaccurate data.

Innovations in applications development languages are just now beginning to make it possible for users to create their own, fairly complex applications without involving MIS.

One of the results, notes Larry Woods, manager of research at John Deere Information Systems, is the creation of hundreds of scattered data bases, resident on users' hard disks.

"Sure, MIS may have control of the data base on the mainframe," Woods says, "but the users are creating their own to get around the restrictions placed on them by MIS. Maintaining data integrity? Forget it."

The soft scientist

In addition to business and technological considerations, today's MIS managers are finding that it is in their interest to know something more about the so-called soft sciences.

For example, Landen Bain, the administrator for information systems at Ohio State University Hospitals, is currently exploring the impact nontechnical issues have on technical decisions.

When Bain began to network his facilities' scattered departmental systems, he realized that "getting the computers to talk to one another would be an impossible task if I couldn't get the people to talk to each other first." When working with users, Bain adds, psychological factors are just as important as deciding which network to install.

At an even more fundamental level, major developments in physics and philosophy are subtly but forcefully affecting MIS. Patricia Seybold, president of The Office Computing Group, Inc. in Boston, points out, "We are in the midst of a shift that is more than a change from the industrial age to the information age. It is a shift in the way we relate to the world in which we live."

Given the interplay of all these forces, from the continuing PC revolution to new views of interconnection, just how are individuals on the front line restructuring their jobs and the MIS function to meet these challenges?

As is evident in the following profiles, MIS managers are adopting solutions as diverse and complex as today's computer environment.

Regrowth

When Elaine Bond, senior vice-president of corporate systems at New York's Chase Manhattan Bank N.A., looks out over the bank's sprawling, highly decentralized operations, she sees not chaos but a new order being formed.

Chase, with more than $90 billion in assets and about 45,000 employees, has 100 data centers as a result of a decentralization program begun in the 1970s.

"We got carried away at first," Bond remembers. "Because the centralized data processing utilities were not responsive, we let the business units have control. It was autonomy almost at the product level."

The 'competency center'

As a result, the organization currently mixes hardware, including IBM's 4300, 3090 and System/34 and 36 machines, Digital Equipment Corp. VAXs, Wang Laboratories, Inc. VS systems and former Burroughs Corp. boxes. As in most large corporations, PCs are ubiquitous, and networking, including the use of PC local-area networks, is on the rise.

Today, Bond says, she and her colleagues in MIS are looking for opportunities to take advantage of the features that come with diversity. They are interconnecting the islands of automation through distributed processing and networking.

"As the PC LANs tie into our larger systems, we work with the user community," Bond says. "This is where information systems comes into its own: Helping to develop the functional systems is how we earn our keep.

"We have become competency centers with a vision of where the technology is going and how it meshes with the company's overall strategic direction," she adds.

What's in a LAN?

One result of the heavy emphasis on networking, Bond says, is that Chase is now "regrowing the data center." In a sense, networking is a way of centralizing what had become a highly decentralized operation characterized by widespread systems.

After all, she explains, a LAN is really a computer, but one dispersed over a wide geographic area rather than sitting in a room or on a desk. What users have traditionally thought of as computers are simply nodes, integral parts of a larger information system.

Bond points out that, as with more conventional stand-alone computers, "you have to configure a LAN, you have to staff it and manage it. . . . It takes direct-access storage devices . . . and it also allows the user community to make all the mistakes we made back in the early days of data processing.

"There's nothing like experiential learning," she adds.

Bond says she sees two fundamental roles existing for MIS. One is to keep pace with the increasing complexity of the technology: to keep the pieces working together smoothly, to learn how to modify the technology to appropriately meet the organization's needs — in other words, to become high-level systems integrators.

"Our other role," Bond says, "is to advise and counsel the growing ranks of increasingly sophisticated users through the medium of information centers or applications centers and by moving analysts out into the user community."

Chase Manhattan's Bond

A bit of both

Burlington Industries' Fish throws up his hands when he hears discussions over the choice between centralization vs. decentralization.

"We've been over this time and time again," he says. "I hope that someday someone will tell us what the real answer is.

"At regular intervals," he continues, "a new manager will come to us and say, 'Look, I can do my job faster and cheaper if I have my own equipment.' That sparks an expensive consulting study, and we always get the same answer — tailor the information system to the desired solution."

Fish says that his organization is neither centralized nor decentralized. "We have a little bit of both," he explains.

At the corporate headquarters MIS shop in Greensboro, which Fish calls the 'glasshouse,' there are two large IBM mainframes, but VAXs populate the manufacturing areas.

In addition, between 600 and 700 PCs are scattered throughout the company's facilities.

"With the VAXs, we now have about three to five times the computing power at the plant level as compared with the IBM gear in the glasshouse," Fish says.

Despite the multivendor shop environment, Fish, like Chase's Bond, says he sees networking as a critical component in MIS's new role.

"We need to beat the off-shore competition," Fish says. "As a result, electronic data interchange and networking are really becoming essential to us as well as to our suppliers."

At Burlington Industries, the MIS organization has always kept it in mind to attempt

Continued on next page

The new MIS

Tips on managing information systems into the '90s

Understand the needs of your company: The business of MIS is to support corporate financial and strategic goals

Keep pace with the increasing complexity of technology: One of MIS's roles is to become high-level systems integrators and to counsel the growing ranks of increasingly sophisticated users through the medium of information centers or applications centers and by moving analysts into the user community

Integrate information systems planning: Incorporate this segment with the company's business planning

Buy back control of the computing resource: Data integrity is an issue with the prevalence of distributed processing

Don't forget people issues: Getting computers to talk to one another is an impossible task if you can't get people to talk to each other first; MIS should build a feeling of trust between itself and those who are operating the user islands of automation

Be the first point of contact with user departments: An information center, reporting to MIS, can function as a large part of this enhanced MIS and end user relationship

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MIS profession is not what it used to be

It's agreed: The job you save just might be your own

Once upon a time, there was a company in a pleasant little town on the East Coast that had a data processing department, a mainframe, lots of users and a fat budget. Life was good . . . until one day the company was bought out by a larger organization.

The new managers promptly fired all the DP people, got rid of the mainframe and scattered a handful of personal computers with hard disks among the company's users.

Almost overnight, the firm went from a centralized DP operation to extreme decentralization. And the careers of some three dozen information systems professionals took an abrupt turn.

Keeping a close watch

This scenario, patterned after a real-life incident, does not represent a major trend sweeping the country.

But today's widespread restructuring of the MIS function does mean that information systems professionals need to keep a close watch on how their chosen field is changing.

> "CAREER development [for information systems professionals] is difficult. You need a desire to transcend yourself out of the world of technology to be tomorrow's managers of technology."
>
> FRED FORMAN
> AMERICAN MANAGEMENT SYSTEMS, INC.

The job you save, as the saying goes, may be your own.

"Career development [for information systems professionals] is difficult," says Fred Forman, director of the Corporate Technology Group at American Management Systems, Inc. "You need a desire to transcend yourself out of the world of technology to be tomorrow's managers of technology. . . . The burden is really on the individual to move up the career ladder."

Because the entire information systems profession is undergoing such turbulence, opinions on its viability as a career vary widely.

Know the business

R. Talmage Fish is manager of information systems at textile manufacturer Burlington Industries, Inc. in Greensboro, N.C.

He, too, emphasizes that today's — and tomorrow's — MIS manager must have a much better feel for the business direction of the corporation.

Fish says both he and his manager, the director of information systems, have financial backgrounds in addition to their information processing skills. One of their roles within Burlington, he points out, is to develop "the business literacy of our information systems people.

"We hire very few pure computer science graduates," Fish continues. "Instead, we employ people with a business degree and a minor in information science. This is more and more of a definite trend."

On the other side of the shop is Larry Woods, manager of research at John Deere Information Systems in Moline, Ill. Woods' information systems function evolved down the technical path, but he stresses that the technical professional's job isn't what it used to be.

"It was fun back in the 1960s. We worked with entire systems; we made very creative patches," he says.

But, Woods adds, as more and more layers of patched code built up on operating systems and the corporation's aging applications, a programmer's job was reduced to applying patches supplied by the vendor — in most cases, IBM.

In large corporations, Woods says, MIS began discouraging its talented programmers from trying to fix the company's large applications.

According to Woods, "the boss told his workers that because of the multiple layers, they had a house of cards. His directive was, 'Call the IBM systems engineer. It's too complicated for anyone in-house.' "

Thus, there is very little creativity left in the big shops, Woods says. Fixing bad software is a 9-to-5 coding job.

"The fun stuff is done on the PCs, and the sharp programmers are winding up in the end-user departments," he adds.

Will this movement out to user departments tend to narrow a programmer's range of experience and limit career possibilities?

Probably, Woods says. He points out that MIS is already overspecialized, with career niches being carved out in such narrow areas as data base, Cobol coding, operating systems and so on.

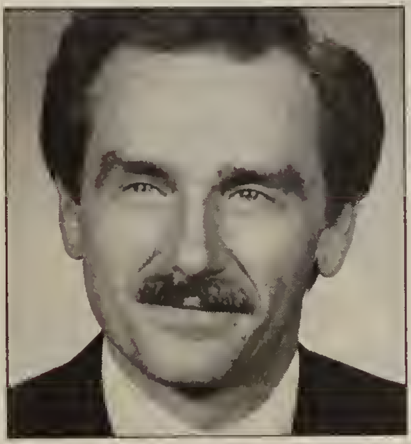
In-house mobility

On the other hand, mobility is the watchword for DP employees at Pepsico, Inc. in Purchase, N.Y., where the corporate culture provides for a wide range of in-house business and DP experience.

Elizabeth Menten, Pepsico's information center manager, reports that there is a frequent movement of information professionals from the systems department into major user departments — and vice versa.

Menten says that at Pepsico, "your career is really up to you. You can make it your business to build a career in a given departmental area. As the role of information systems and the information center matures, the company is recognizing the growing strategic value of the function.

"And there are a lot more opportunities for promotion," she adds.



"THE FUN stuff is done on the PCs, and the sharp programmers are winding up in the end-user departments."

LARRY WOODS
JOHN DEERE
INFORMATION SYSTEMS

It is this mobility that William A. Roberts, vice-president of information systems at Pacific Mutual Life Insurance Co. in Newport Beach, Calif., is attempting to deal with as he considers the careers of DP professionals both in and out of the information systems department.

Roberts admits that "the MIS career is not as attractive as it was five years ago." Today, Pacific Mutual provides a mixed environment for its systems professionals as the company continues to centralize some functions and decentralize others, depending on the needs of the user departments.

"All this uncertainty and change has caused some discomfort," he says. "But despite this, there is a clear perception on the part of the corporation that information systems is playing an increasingly important role."

Roberts says he agrees with Deere's Woods that many of the interesting applications are currently being performed on PCs in user departments, but he says the fundamental strategic systems are still housed on mainframes and central minicomputers. "We still are in need of systems professionals skilled in Cobol," Roberts says.

Mix and match

At Chase Manhattan Bank N.A. in New York, Elaine Bond, senior vice-president of corporate systems, provides a unique twist on the question of MIS careers.

"We are a mature enough discipline to be able to blend an organization with different kinds of skills," she says.

Although Bond says an information systems professional cannot be a good leader without having a solid grounding in the technology, she points out that the MIS manager can mix and match to create the blend of technology and business talents required by a particular managerial situation.

There is still a split in preference, though. Bond refers to those in the upper echelons of corporate management as "blue-suiters."

"If the [systems chief's] strength is technology, he or she can buy the blue-suiters to do the talking and the planning," she says. "Or, if they are inclined toward being blue-suiters, then they can buy the technologists."

American Management Systems' Forman offers this advice for those MIS professionals who aspire to the boardroom. Find a mentor, he says — someone in top management who is willing to train you in the various business aspects of the corporation.

Ultimately, however, it is up to the individual to steer his MIS career in a chosen direction.

"There is a lot of personal salesmanship involved," Forman says. "I don't recall many cases where a company's management came to the systems person and said, 'I want to make you the CIO.' "

JOHN KIRKLEY

Restructuring

FROM PRECEDING PAGE

to maintain total compatibility so that all of the organization's PCs and terminals are able to communicate. MIS issues a recommended buy list of hardware and software to guide user departments. In addition, IBM Systems Network Architecture and the Synchronous Data Link Control protocol are installed throughout the company.

"We're now using T1 carriers between major corporate locations," Fish says, "and we're trying out satellite links in an effort to reduce costs further."

Telecom a key

Telecommunications at Burlington Industries is more than installing telephones — it is a key part of MIS strategy. For the last eight years, information systems, telecommunications and office automation have all existed under the same umbrella.

"This has helped us leverage the technology to support the business," Fish says. "I also think it's significant that our director of information services reports to the corporate vice-president of manufacturing services."

Fish asserts that the MIS manager is going to take over the telecommunications manager's job, not the other way around. In fact, when Fish or his colleagues attend AT&T Customer Council meetings, they suggest AT&T direct its marketing to MIS management as well as to the communications department.

"But right now, for MIS at Burlington, I think the biggest issue is to better integrate information systems planning with business planning so that we're both going down the same path at the same time," Fish says. Electronic data interchange, he claims, is forcing this issue.

"More and more, the operational people are coming to MIS and asking how we can meet the moves of our competition," Fish says. "We're taking on an increasingly strategic role within the organization."

A clear plan

"We've moved from fire fighting to acting as a strategic unit," says Elizabeth Menten, manager of the information center at Pepsico, Inc. headquarters in Purchase, N.Y. Menten joined Pepsico about a year and a half ago, after working at the Gartner Group, Inc., based in Stamford, Conn. The major changes that have occurred at the center happened under her leadership.

"When I first arrived, the information center was in a separate building from the Information Systems Group," she recalls. "Users with problems would call in over a hot line. Anyone who was around would take the call and then try to find someone who had the expertise to handle the problem."

All that has changed. One of the first things Menten did was to assign each of the center's staff members to a specific department. This move allowed information center members and department personnel to get to know each other and provide a clearly defined system for reporting and resolving problems.

"THIS is where information systems comes into its own: Helping to develop the functional systems is how we earn our keep."

ELAINE BOND
CHASE MANHATTAN BANK

The center was also heavily engaged in user training, an activity that overloaded the resources of its small staff. Menten contracted with an outside training firm and instituted a chargeback system.

In addition, user departments were uncertain as to which organization in the company handled computer maintenance; the calls would often be routed through the information center. In this case, a single contact point was established within the corporate MIS function. The actual maintenance was, and continues to be, handled by an outside vendor.

Several years ago, Pepsico's management decided to put even greater emphasis on MIS's role as the first point of contact for user departments. The information center, which reports to MIS's Information Systems Group, was very much a part of this enhanced MIS/

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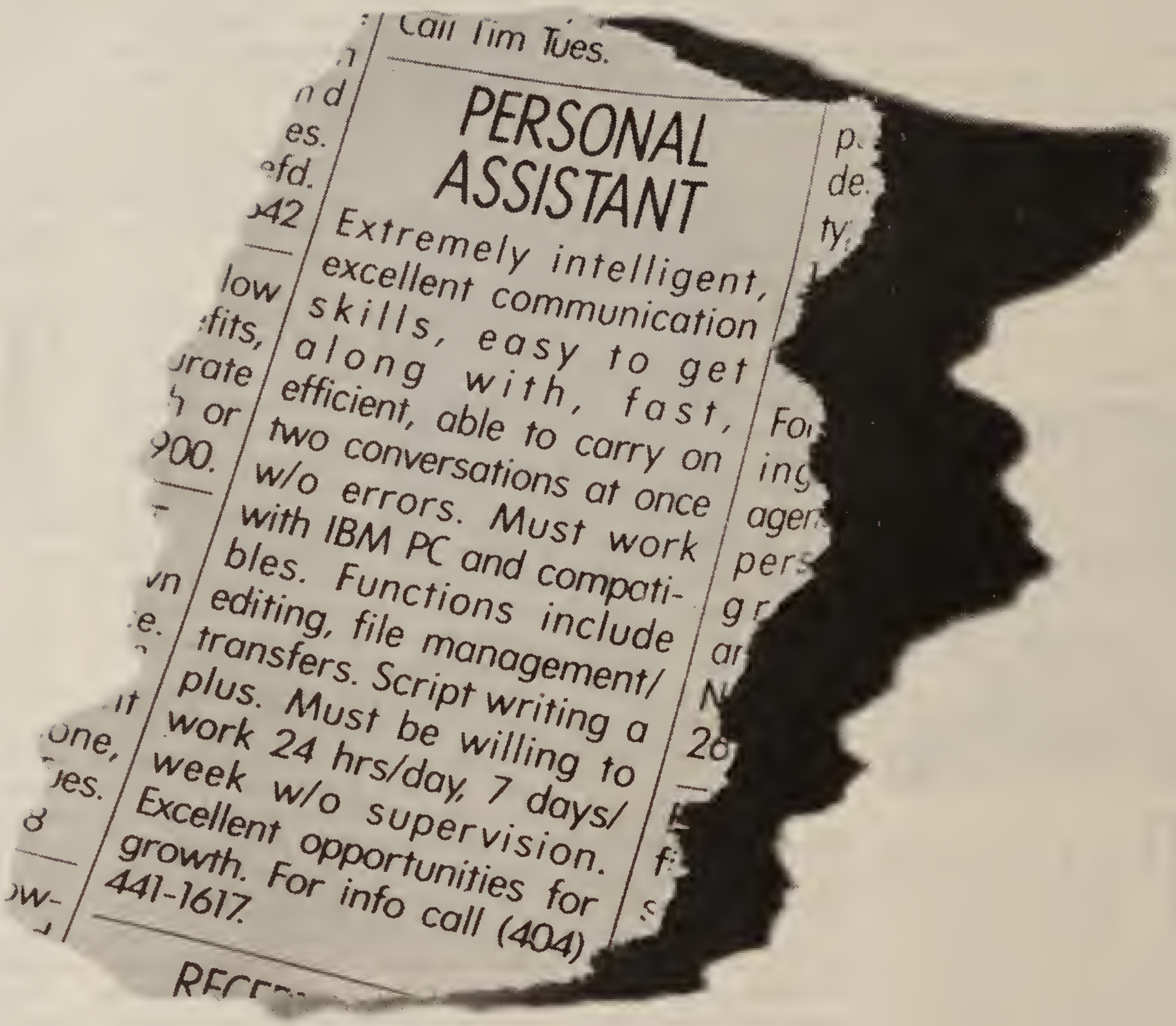

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Hayes.

end user relationship.

With routine functions such as training and PC maintenance assigned to outside sources and the decision to involve the center more in promoting end-user applications, there has been greater opportunity for both the center and the Information Systems Group to take a proactive role in generating strategic projects.

For example, a major, ongoing activity involves the selection, implementation and management of LANs. Menten's staff works closely with the Technical Planning Group within information systems to establish standards.

Recently, the telecommunications organization, which had limited involvement in LANs, expressed an interest in playing a more active role in the process.

LAN club

What has evolved is a LAN administrative body that sets standards, selects vendors and is involved in every installation. Represented at the meetings are the departmental organizations that will ultimately be the users of the network.

"THE operational people are coming to MIS and asking how we can meet the moves of our competition. We're taking on a strategic role."

R. TALMAGE FISH
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"There's been a change in attitude in recent years," Menten says. "There is far more opportunity for MIS with regard to generating strategic opportunities."

Menten's group, for example, recently worked with the company's Department of Corporate Affairs, which produces the annual report — a $1 million document.

"With our help," Menten says, "they shifted from typesetting the report with outside vendors to using Macintosh SEs and Macintosh IIs and a laser printer to produce the camera-ready copy."

This Apple Computer, Inc. system has saved more than $30,000 in production costs and has made revisions faster and easier.

Last year was a time for evaluation at Pepsico's information center. In an effort to avoid becoming a backwater function — a department devoted solely to training or working only with PCs — the information center is now involved in planning LANs, looking into electronic publishing, developing data management plans and helping to chart overall DP strategy.

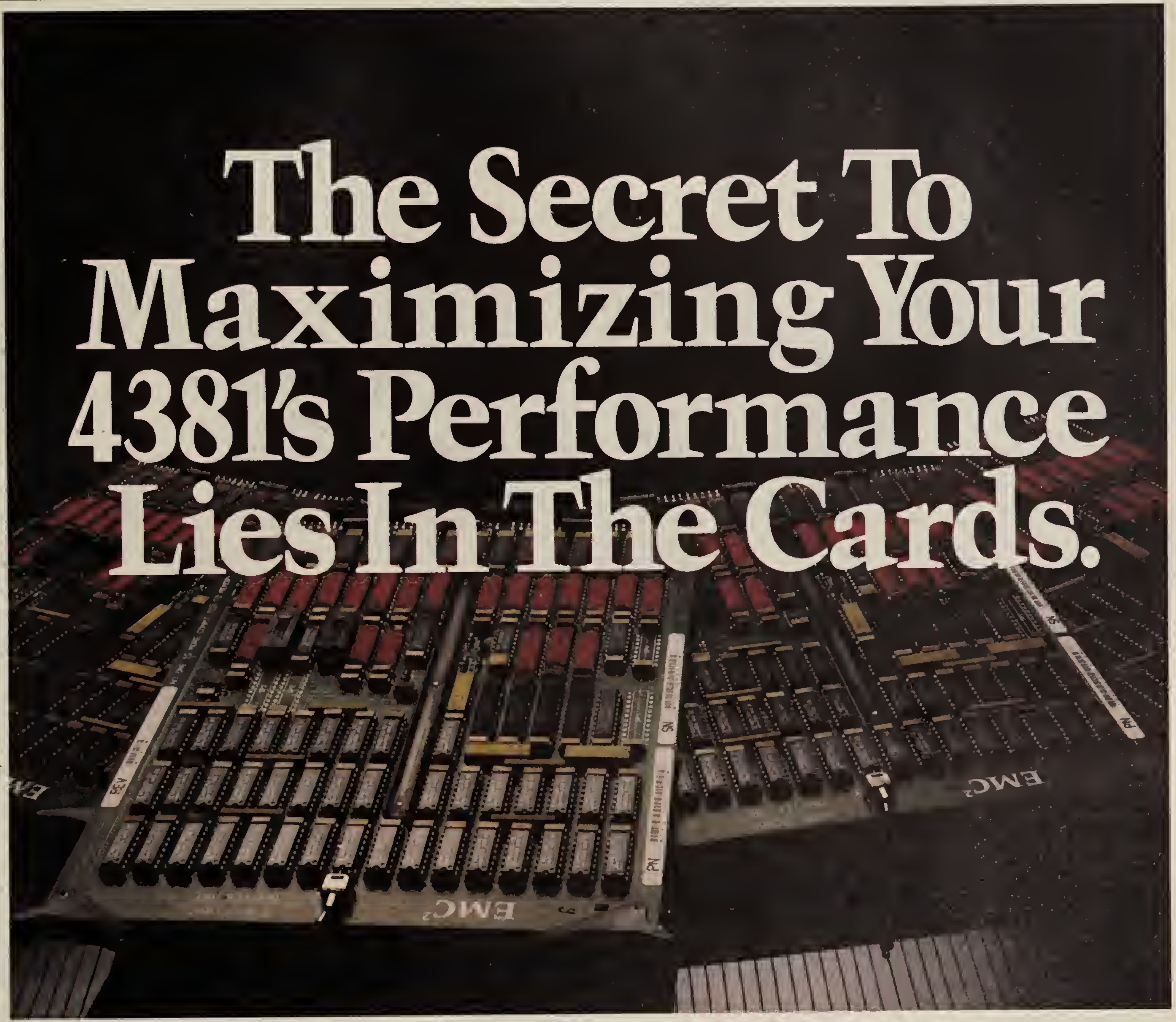
"We have definitely become more strategic. . . . We've gone back to what an information center implied in the first place," Menten says. "Our role is to unearth opportunities that exist in user departments and promote those opportunities using today's information systems technology."

A CIO from outside DP

"I've never written a Cobol program," Ohio State University Hospitals' Bain admits.

But Bain, who has a background in business and management and was trained as an industrial engineer, has had extensive experience developing information and productivity systems. He functions as the chief information officer of the hospital system and is one of 11 administrators who together form a peer group chartered to deal with the hospitals' overall business concerns.

"The hospitals are highly decentralized," Bain says, particularly because of changes that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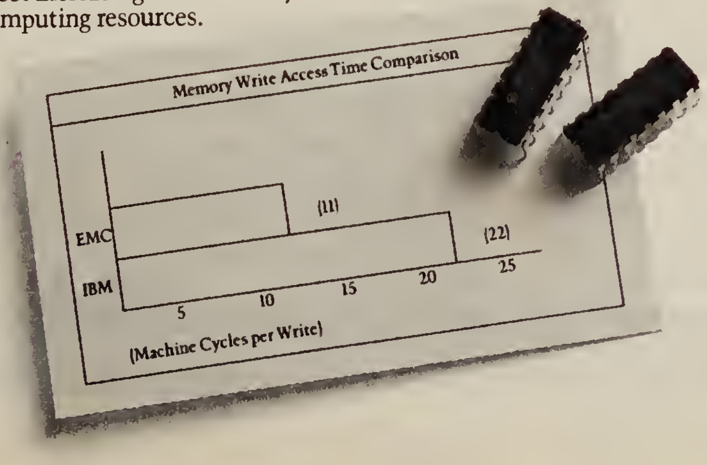

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occurred in the past four to five years.

Initially, DP functions at the university hospitals were those of a traditional IBM shop working on such back-office jobs as accounting, admitting and patient billing. But when departmental computers began cropping up in operational areas such as radiology and cardiology, often without the involvement of DP management and sometimes despite its strong objection, problems arose.

"We had automated the business functions but not the operational ones," Bain says. "The physicians had a lot to do with driving the use of departmental technology; they're used to operating in a semi-autonomous fashion."

> "WE HAVE definitely become more strategic. . . . We've gone back to what an information center implied in the first place."
>
> ELIZABETH MENTEN
> PEPSICO, INC.

Bain says information systems began to establish data links between mainframes and minicomputers in the operational divisions.

"We were getting lab reports and displaying them on a CICS terminal using IBM 3270 emulation. This was good, but I told my team that there was more to life than 3270 emulation."

Bain was aware of the inroads PCs were making into the organization. When he was promoted to his current position 2½ years ago, he knew he had to pull the scattered operation together.

With the promotion came additional responsibilities for telecommunications, data management and planning, microcomputers, medical records, hospital quality control and utilization review. The latter assignment involves ensuring that hospital resources such as drugs, computer equipment and expensive radiology gear like CAT scanners are being used efficiently.

People first

One of the first tasks Bain undertook was to form a management committee that included the hospital director of management planning and analysis, the director of management engineering responsible for patient statistics reporting and the DP manager. As his next step, Bain embarked on an ambitious program to network the various, scattered departmental systems — many of which were VAXs — and the mainframe.

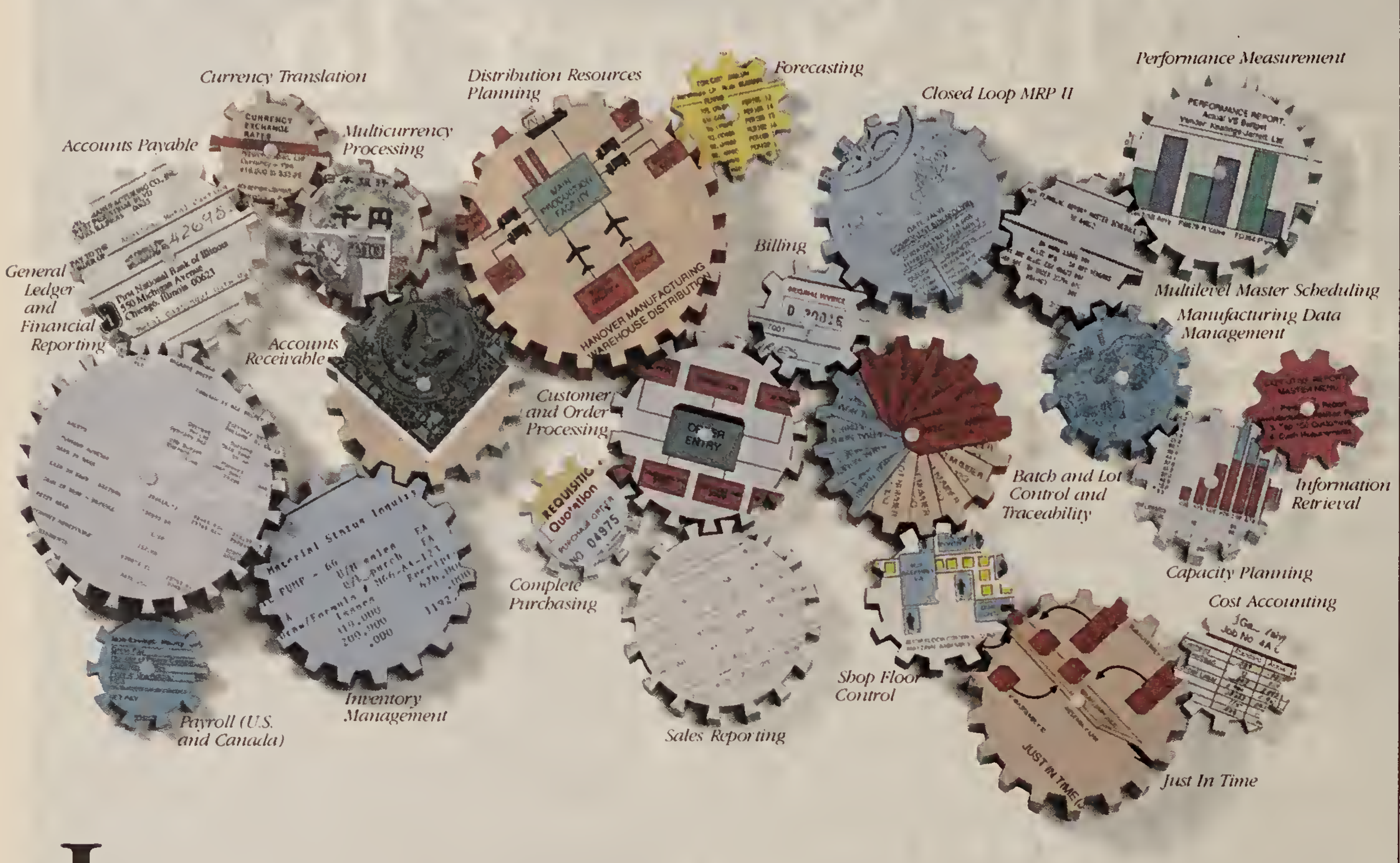
"I made a few false starts, a few clumsy attempts to put together one big happy family," Bain remembers. As a result, he learned that MIS has to build a bond of trust between the information systems group and the people operating the user systems.

To ensure the network's completion, Bain formed an interdisciplinary team made up of members of user organizations, a microcomputer specialist, a registered nurse with experience marketing clinical information systems and a systems engineer from DEC. DEC had been chosen as the vendor to create the overall network using Ethernet.

The network has since been implemented: Ethernet went live in January, and the PC on Bain's desk can now talk to seven minicomputers and mainframes. This data path for the hospital user population will allow MIS to provide such critical functions as routing laboratory test results — nearly four million of them a year — to terminals and PCs, wherever the information is needed.

Now one of Bain's major goals is to build a strategic "physicians network,"

Continued on page 91



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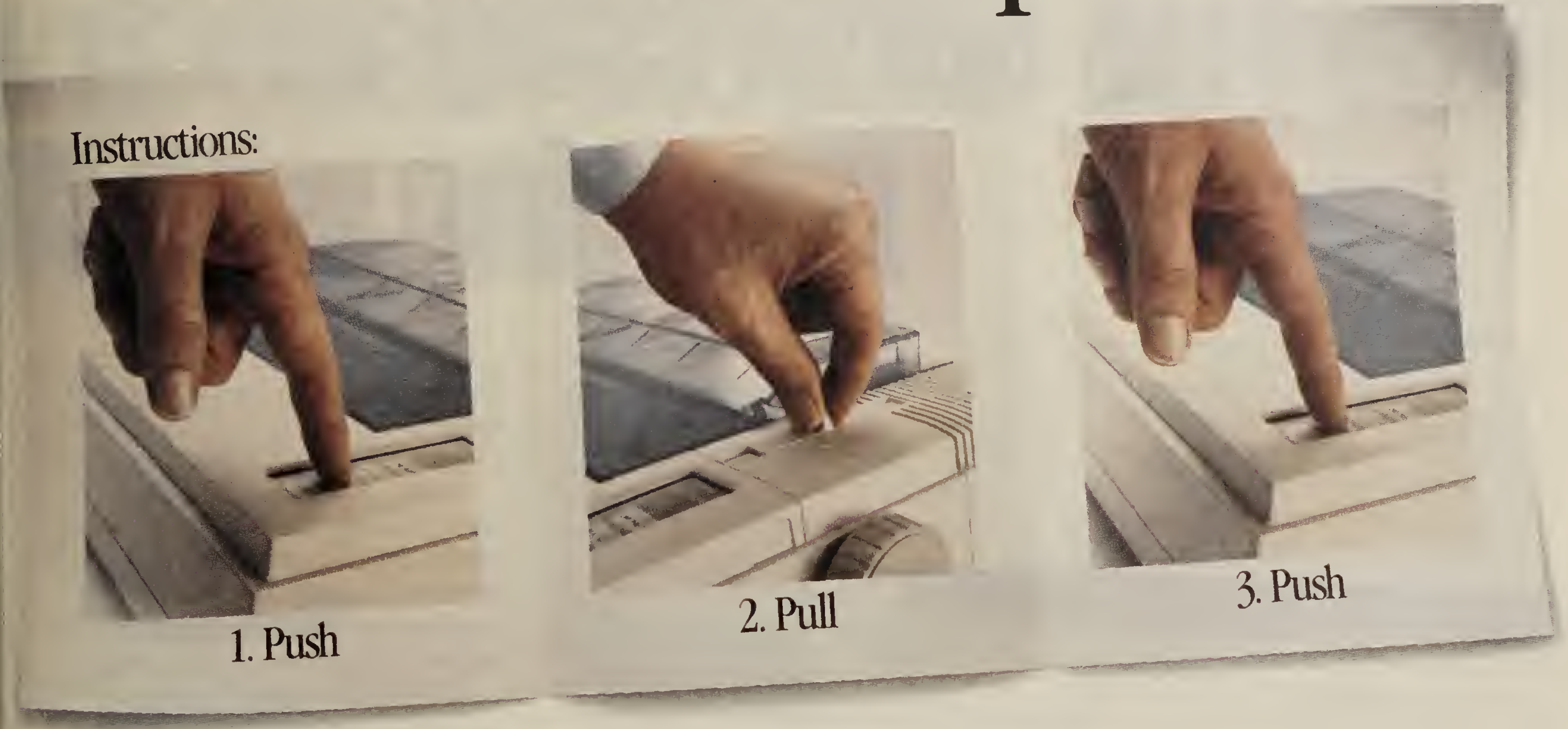
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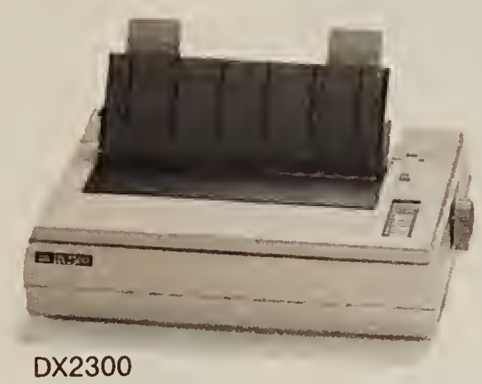
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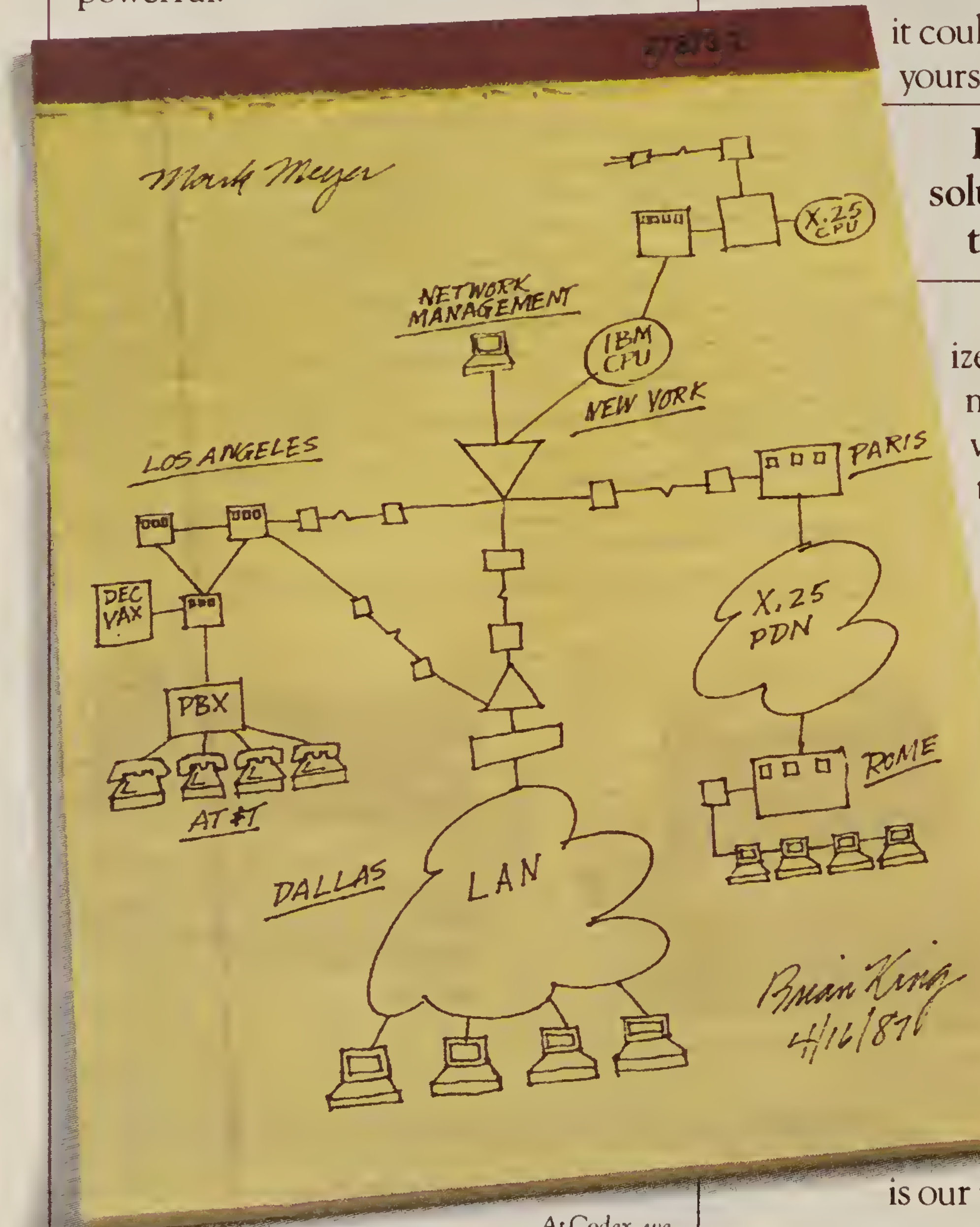

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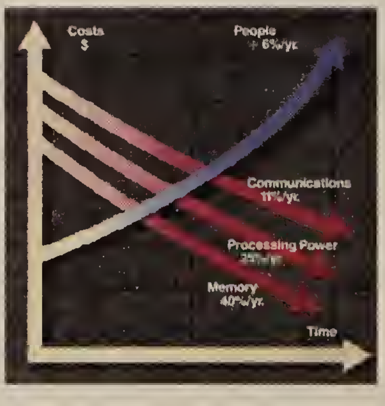

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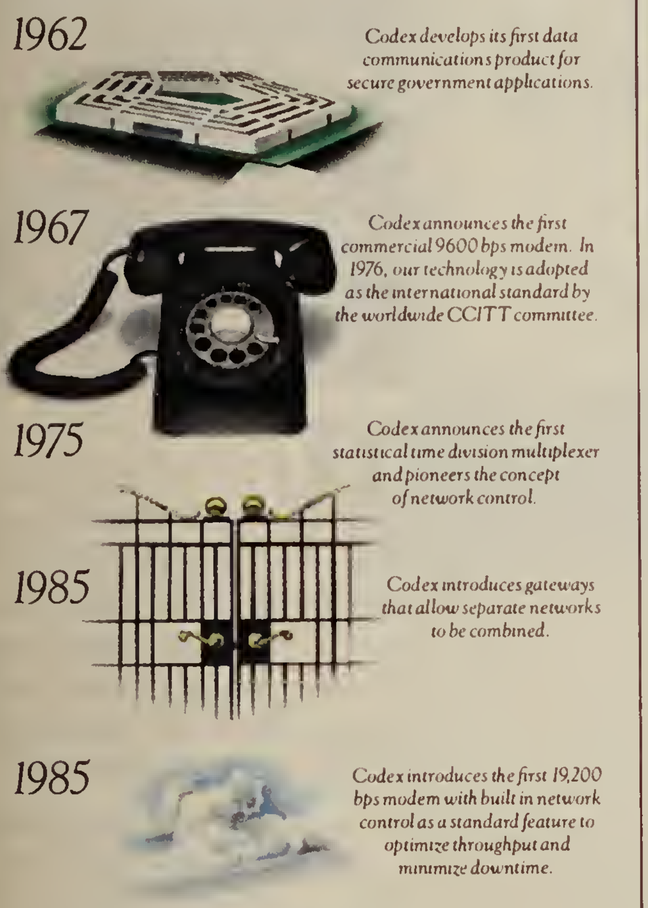

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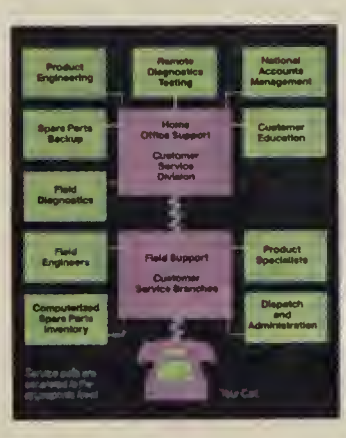
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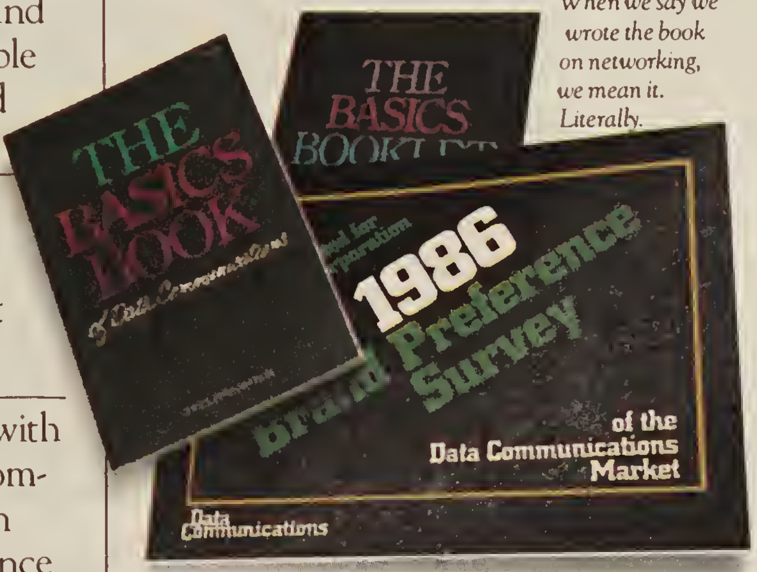
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Distribute or centralize? Strategies for support

BY MICHAEL BALL

One of the realities of information systems management today is the prevalence of distributed or remote computer systems.

MIS managers can commonly support and maintain these systems from a central site by automating as many of the maintenance functions as possible, or they can let the remote site provide its own support, as long as it meets corporate standards. Which method is best depends on the system's complexity and the corporate culture.

Regardless of which one is used, sufficient skills and talent must be available on-line or in residence at the remote sites for operations, emergencies and MIS maintenance.

The following is a tale of two shops. One is trying hard to distribute support; the second has moved to consolidate support at a central location.

The distributed system

"We push the process closer to the decision makers," says Gary Biddle, vice-president of MIS at American Standard, Inc., a home fixtures manufacturer based in New York. His company has a well-established distributed computing strategy and a support system to match.

American Standard's approach is to staff each remote site, letting information systems professionals configure their systems as they see fit and to offer technical services at the remote location's request.

American Standard currently has three distributed sites, and Biddle says he expects 10 more to have distributed manufacturing control systems by the end of the year. The central shop runs IBM 3084 class mainframes supported by three levels of processors. The remotes operate Digital Equipment Corp. VAXs and IBM 9370s.

The motivation for this distributed strategy was typical. "Because the computers are going down in price, we're putting applications in more locations," Biddle says. But moving to a distributed system has not been without problems. In fact, technical data processing realities kept American Standard from immediately implementing the sort of support structure that it had hoping for.

"We wanted to put master scheduling in the sites," Biddle says. "Then [the sites] could have control from planning to release to the customer." Such scheduling fits in well with the strategy of letting those in the company who know the requirements best do the data processing.

"WE FOUND that the part of data lagging the most is the distributed data bases. You can't break data bases apart without complex systems of masters and slaves and a lot of telecommunications."

GARY BIDDLE
AMERICAN STANDARD, INC.

"Unfortunately, we found that the part of data lagging the most is the distributed data bases," Biddle explains. "You can't break data bases apart without complex systems of masters and slaves and a lot of telecommunications."

As a result, the central DP unit downloads later in the cycle and does more of the upfront processing than it had planned. In addition, the central staff still provides technical services and also owns the corporate network, Biddle says. Central support also includes downloading software upgrades and replacing applications portfolios when necessary.

At American Standard, the benefits of this shift to remote sites has been a wash in terms of costs for equipment and people, according to Biddle. However, he says, "the real efficiencies come in reaction time and, culturally, in the people feeling they're controlling their own destiny. And they are."

Looking at lights out

In another corporate culture, United Technologies Corp.'s Hamilton Standard is considering more extreme distributed

Continued on page 91

Ball is a free-lance writer based in Boston.

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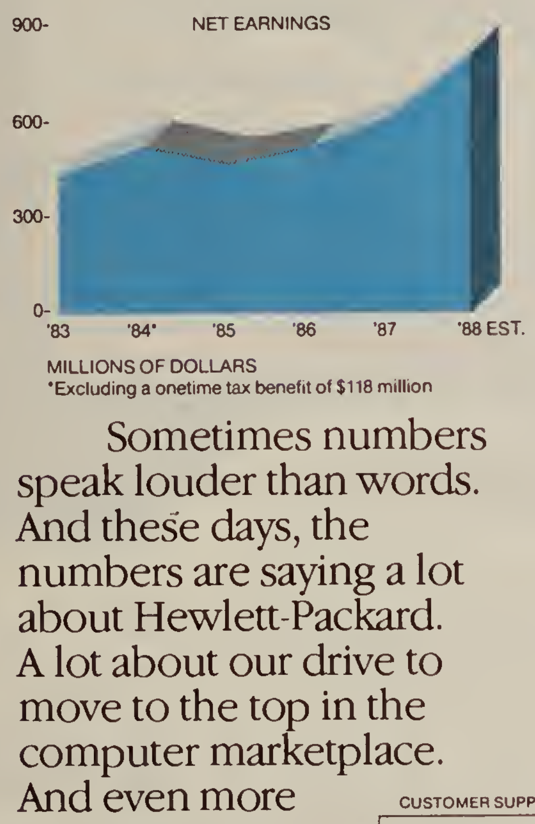

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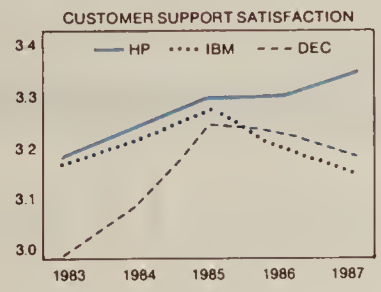

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D - Delete Record                  A - Append Records
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V - Verify Record(s)               VS- Locate next unverified rec
T - Display Totals                 Z - Zero Total(s)
M - Mass Edit                      O - Display Stats
PA- Patch Append                   PE- Patch Edit
L - Level Set                      F - Find Record by content
FM- Show Find Mask                 FX- Enter New Find Mask
FL- Find Like Level                S - Save
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Strategies

CONTINUED FROM PAGE 88

site automation and support.

The firm, an aircraft parts and electronics maker, has several sites in Connecticut and is aiming for data centers to be controlled by the central shop. To meet this goal, Hamilton Standard is working on an automated-operator project — a test site that will eventually run small CPUs in shop-floor manufacturing.

"We will maintain a central data base and load subsets down to the interim CPUs," says Timothy O'Connor, manager of office services and telecommunications.

The aim is to control everything from the central location, except switching the power on, resulting in a lights-out center. O'Connor says he expects to implement a shop floor test site this summer.

Keeping it central

In a larger expression of its DP philosophy, Hamilton Standard's central DP office has managerial responsibility for all computers, including distributed manufacturing and engineering, says Jim Garlans, manager of computer operations.

> "THE MUNDANE things people hated about their jobs went away. . . . Our operators have become much more like problem solvers, and they like it."
>
> JIM GARLANS
> HAMILTON STANDARD

The company has three data centers: one IBM site with 3090 Model 200 and 3084 mainframes; one DEC site with two VAX 8700s, a VAX 8600 and VAX-11/785 minicomputers; and a mixed site with a 3084, a VAX 8700 and a VAX 8650. The automation effort includes centralizing an IBM mainframe operation 25 miles away and putting computers where needed.

"In about a three-month period, we went from 1,100 terminals to 3,000, with 15% to 20% less staff," Garlans says.

The changes might appear to overtax staff capabilities and rob users of support. But Garlans says this is not the case. Automation of mundane entry and monitoring tasks frees operators, allowing them more time for problem solving.

Garlans says he told his staff up front that their jobs would change with automation. While a few employees left, others stayed and ended up pleased with the changes. They engage in a quality-circle-like series of meetings to keep fine-tuning the system. "The mundane things people hated about their jobs went away," Garlans says.

"Even with less staff, we found we had time for training because the operator was freed from doing those tasks. Our operators have become much more like problem solvers, and they like it," he adds.

In either case, it is clear that corporate MIS must have a clearly defined strategy for systems support, provided either remotely or centrally. Without a plan, disaster awaits. •

Restructuring

CONTINUED FROM PAGE 84

which will encompass terminals and PCs both within and outside the hospital's facilities. The system, which is based on DEC's All-In-1 integrated office system, will permit physicians and academics associated with the hospital to generate and access patient information through the network.

A network for doctors

With the system in the prototype stage, Bain is finding that what the physicians are particularly interested in is entering and retrieving outpatient information.

If an outpatient has been admitted to the hospital, the records are already in the system and can be accessed by the attending physician and other staff members who need and have the rights to that information.

"This is a strategic system," Bain says. "It's like an airline reservation system in a way. Because it provides so much information as well as convenience, physicians are motivated to send their patients to our hospital."

It may be strategic, but not everyone has wholeheartedly taken to the MIS automation plans.

"There are a few administrators who want nothing to do with computers," Bain says. "But all in all, most of the physicians are very enthusiastic. Many of them who have their own systems and are quite sophisticated in the use of computers are contributing ideas for new and interesting strategic applications."

Let the users decide

When an MIS department is restructured, user involvement can vary widely depending on the openness of MIS management, the wishes of the company's top echelon and the interest generated by the users themselves. Sometimes, MIS has to be dragged to the bargaining table; sometimes a satisfying rapport is established between the information systems professionals and the departments they service.

At Pacific Mutual Life Insurance Co. located in Newport Beach, Calif., the process, begun two years ago, has gone smoothly. At the very start, William

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USA TODAY Decisionline

A. Roberts, vice-president of information systems, went to the company's strategic business units and made them a proposition they couldn't refuse.

Either, or

Roberts told the units they had a choice: They could either decentralize the MIS function and move the information systems' programmer/analysts into their shops, or they could leave the DP functions inside the information systems department and let that division handle their applications development.

Two of the largest strategic business units, Group Insurance and Individual Insurance, chose the decentralization option. About 100 programmer/analysts and applications support people made the move from MIS, a number that adds up to roughly one-third of the information systems staff.

At the same time, another large business unit, the investment function, which had its business analysts in the department and programmer/analysts in MIS, decided to ship all its business analysts back to Roberts' shop.

"GETTING computers to talk to one another would be an impossible task if I couldn't get people to talk to each other first."

LANDEN BAIN
OHIO STATE UNIVERSITY
HOSPITALS

"It's really up to the heads of the respective businesses," Roberts says. "Some of them feel more in control with a solid-line relationship with their information systems professionals; others prefer to let MIS worry about reporting relationships."

Whether the information systems professionals are decentralized or, to use Robert's term, "dedicated," his firm attempts to maintain a high level of service and interaction.

He has also taken steps to ensure that the programmer/analysts and applications specialists who have joined user departments still feel they are part of the overall information systems effort within the company.

For instance, Roberts issues a quarterly newsletter to all the information systems professionals in the company "to make them feel as if they are part of a single group, even though they're dispersed throughout the organization," he says.

Recently, information systems hosted an off-site get-together of all the information systems professionals; it was a gathering designed primarily to socialize and maintain personal relationships.

Single personality

An MIS function that is both centralized and decentralized could develop schizoid tendencies, but Roberts has avoided that problem by forming an MIS council with representatives from all the strategic business units.

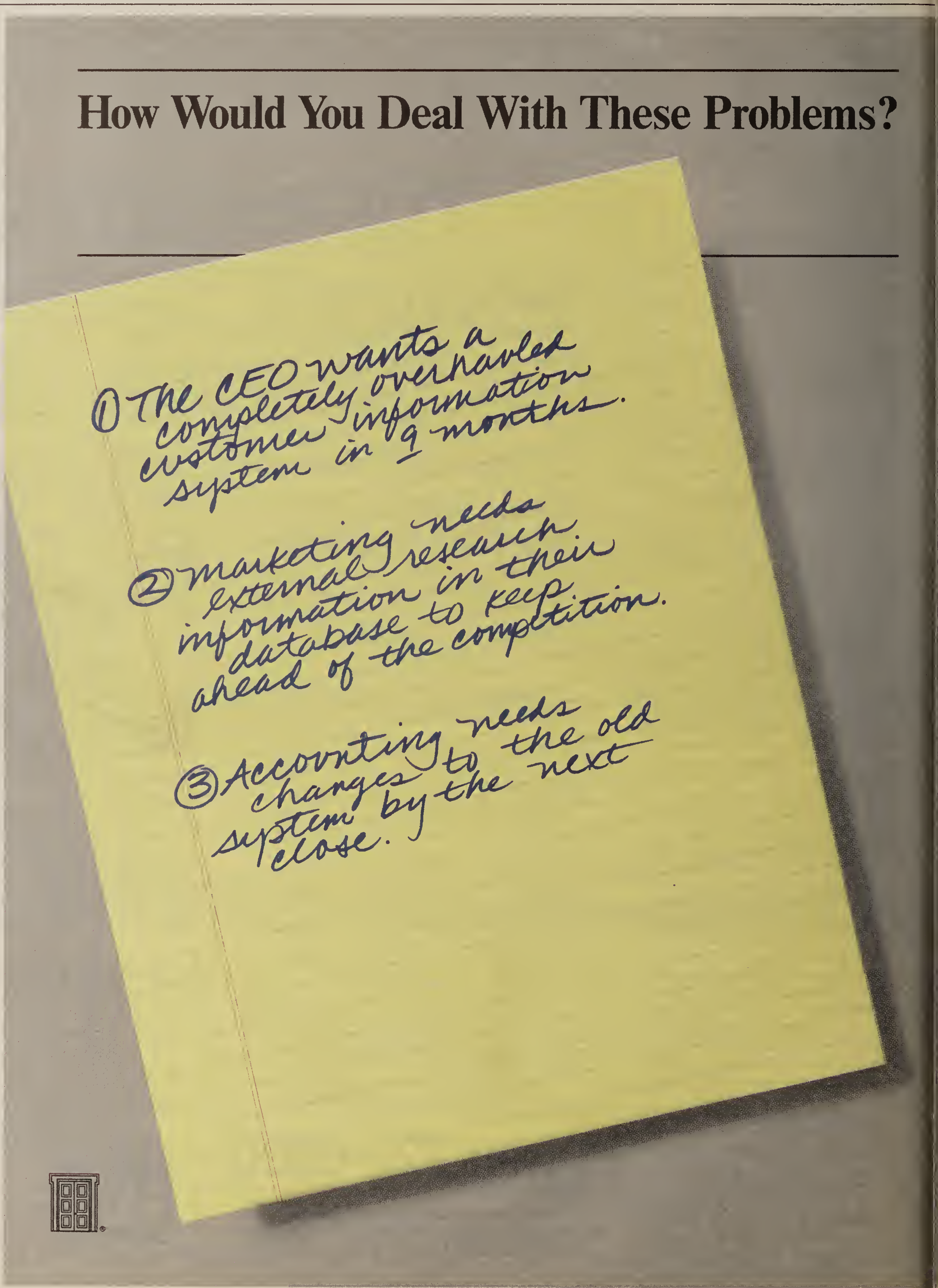
Roberts also schedules formal quarterly meetings to decide on common guidelines, standards, programmer/analyst job descriptions and common systems-level methodologies.

"Ten years ago, the information systems department did not need to use logic and goodwill to achieve our ends," Roberts says. "Now we do, and it's a much more healthy situation.

"Both the decentralized and dedicated organizations have been quick to respond positively to this changed state of affairs."

According to Roberts, the influx of PCs made very little impact on the decision to decentralize. PCs are handled by a PC advisory board that operates on

How Would You Deal With These Problems?



① The CEO wants a completely overhauled customer information system in 9 months.
② marketing needs external research information in their database to keep ahead of the competition.
③ Accounting needs changes to the old system by the next close.

a concept similar to the MIS council. One of its roles is to decide which PCs make the approved buy list. Beyond that point, the individual business units make their own purchase decisions.

One of the major activities of information systems is strategic planning, although, as Roberts points out, today's business environment changes so rapidly that it is difficult to make plans too far into the future.

Each year, prior to the beginning of the budget planning cycle, which starts in August, information systems meets with each business unit to discuss the unit's plans for the coming year. At the same meeting, information systems personnel review systems opportunities that may impact the unit and ask the unit if it wants information systems to adopt any particular technologies or techniques to help it meet its objectives.

Roberts said that in 1987, his department issued 30 white papers on technologies ranging from the implications of three-tiered architectures to expert systems to help the business units in their deliberations.

"Once we talk to the business units," Roberts says, "we regroup and ask, from a systems standpoint, such questions as whether we have to modify our organization and what impact the introduction of new technologies will have on our budget. We document these discussions and send the results back out to the business units for further comment and analysis.

"The results of this activity are not dramatic," he says. "But during the past two years, we have drawn closer to the units." Recent meetings between information systems and user departments have resulted in a somewhat startling conclusion regarding communications: The company decided there is no compelling reason to connect the business units and the central corporation.

A big deal

Given all the talk about connectivity and communications in the press, this was a controversial conclusion, with a big impact on MIS planning at Pacific Mutual.

"We found there was not enough critical information that needed to be sent electronically to justify the expenditures," Roberts asserts. "Maybe if times were fatter we could rationalize expensive communications systems."

MIS does recognize the value of setting up LANs within the business units for intradivisional communication. But, he comments, the department will let others deal with the latest advances in technology; the company will observe the activity from "two or three paces back and save some money," he says.

Despite the changes and restructuring impacting the insurance industry, Pacific Mutual and Roberts' organization, he concludes that "there is a clear corporate perception that information systems is playing an increasingly important role."

Like many other MIS departments, Roberts and his colleagues in information systems are taking an increasingly proactive part in the development of strategic systems that contribute directly to the success of the business enterprise. •

"TEN years ago, information systems did not need to use logic and goodwill to achieve our ends. Now we do, and it's a much more healthy situation."

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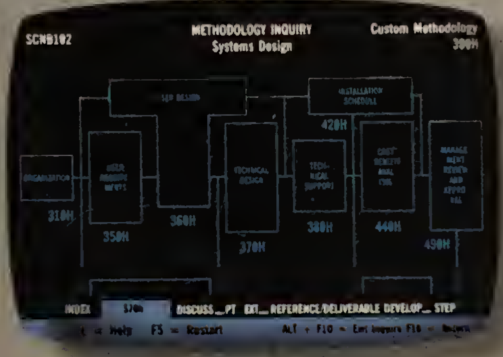

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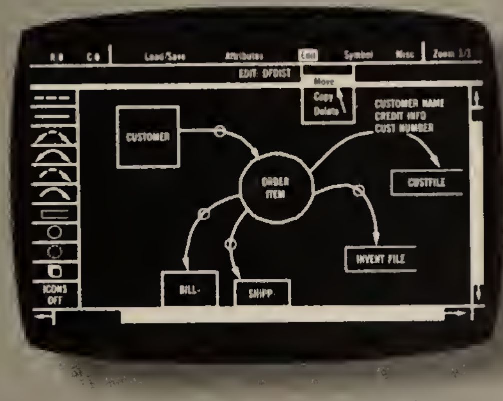

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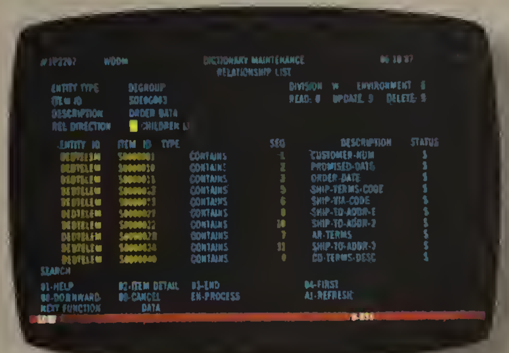

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IN DEPTH

Not just another end-user liaison

Pick the best of your staff as internal consultants to boost credibility, drain backlog

BY MICHAEL SULLIVAN-TRAINOR

As the challenges of the mid-1980s — personal computing, distributed processing, the need to develop strategic systems — change the rules of the game, MIS managers are creating new roles for their most savvy professionals.

These veterans are becoming internal consultants, charged with bridging the gap between end users and technical staffs to further the goals of information systems and the company as a whole.

Unlike other MIS personnel who mix business awareness with technical tasks, consultants are generally free from long-term technical duties and spend most of their time working directly with end users.

Some MIS organizations designate individuals to respond to user requests as they come up; others set up "strike forces" — teams that actively seek out ways to improve business functions.

A marketable item

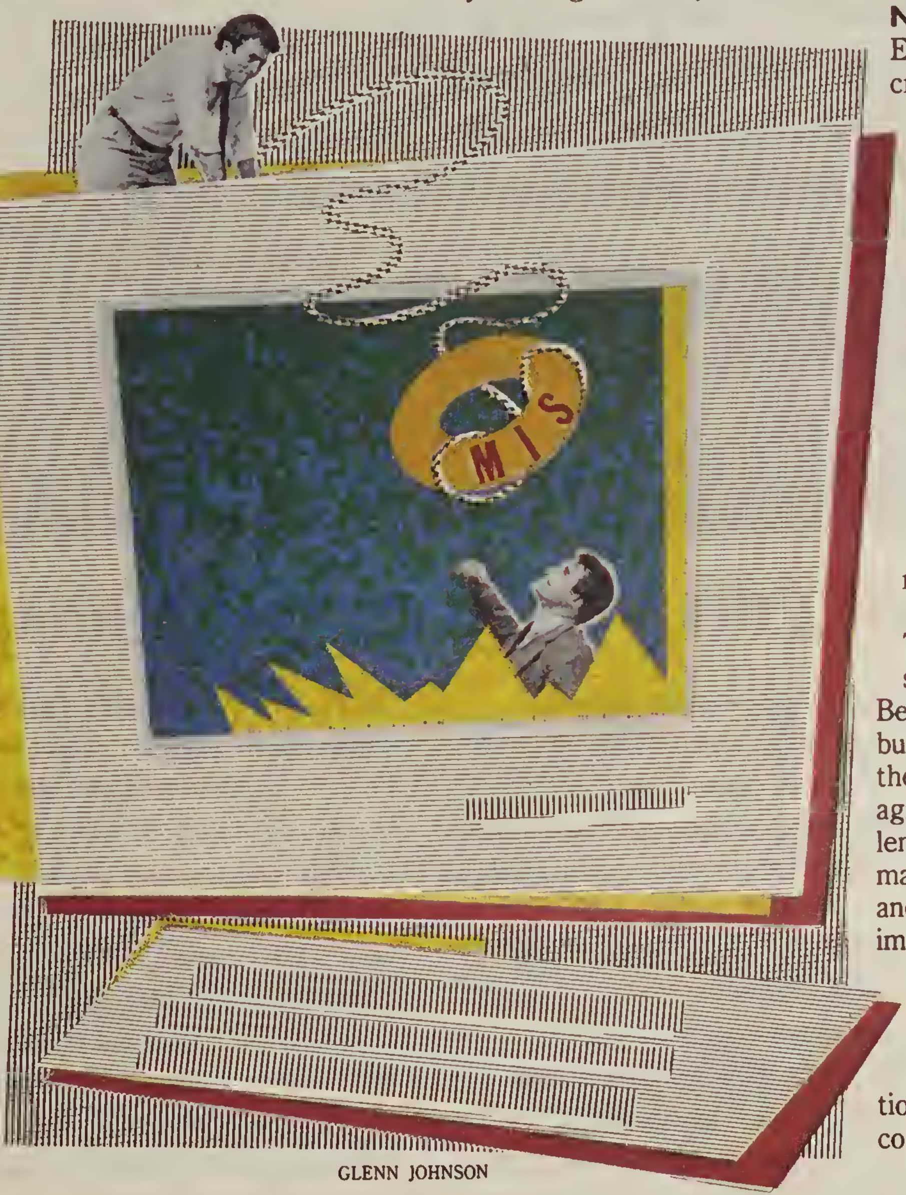
Whether they are a few solo point men or an army of eager applications developers, these professionals are responsible for marketing MIS as well as promulgating that department's unique ability to provide automated solutions.

"Marketing is not selling yourself but giving information about what you can do," says Martin Montgomery, information center specialist at John Hancock Mutual Life Insurance Co. in Boston. Montgomery performs a consultant role at John Hancock, working with users to increase their awareness of MIS services. "We're trying to create an understanding of how we can work in a partnership with other departments to improve the operations of the company," he says.

Montgomery and other internal consultants face growing outside competition for departmental managers' attention.

"At the very least, a business executive can watch the commercials between quarters of football and see a wide variety of hardware and software systems that appear to meet any need," says George Nunney, business systems consultant at TRW, Inc. in Cleveland.

Besides outmuscling rivals as varied as the local personal computer dealer and the newest systems integrator on the block, internal consultants are also overcoming the traditional perception that "MIS is a group of intelligent, very rigid people with preconceived notions about how things should be done," Nunney says.



GLENN JOHNSON

New attitudes

Effective consulting can increase the visibility of MIS within the firm, ensure that systems are developed in line with corporate policy and, eventually, change end users' attitudes about MIS professionals.

An internal consultant has a number of choices in the role he takes — and his success depends on that choice. Management consultants Arnoudse & Oullette Associates, Inc. in Bedford, N.H., define internal consulting roles in the following ways:

The technical expert. This is the role MIS professionals slip into most easily. Because it requires him to do the bulk of the work, this role makes the consultant responsible for diagnosing and solving the problem, initiating communication, making the technical decisions and providing instructions for implementation.

The client takes a more passive role: He explains the problem, answers questions and follows instructions. This scenario does not encourage end-user commitment,

- **'Strike force' to attack backlog**
- **Technical expert vs. hired hand**
- **Consultants are made, not born**

Sullivan-Trainor is *Computerworld's* special projects editor.

and if the system fails, the fingers will be pointed at the consultant.

The hired hand. Less assertive consultants can just as easily fall into this role. Here, the client is totally in charge, and it is up to the consultant to match the client's specifications with technical solutions. Also heavy on the consultant's work load, this role absolves him of credit or blame for the project. He can always point to the client as the instigator.

Hancock's Montgomery

The problem-solving partner. In most cases, this is the best tack to take, but it is often the most difficult to attain, as well. It requires the consultant to call on his full complement of skills so that both he and the end user are actively discussing the problem and working toward a solution.

Part facilitator, part assertive interviewer, the problem-solving consultant must place his technical bias behind him and see things as much as possible from an end user's point of view. He must show an understanding of the problem and express the realistic possibilities for a solution.

Most of the consultant's charge is to develop a shared sense of responsibility with the user and reach an agreement on how the matter will be handled.

When end users refuse to be involved in the project except in a peripheral manner, the role of "technical expert" can work. One consequence, however, is that the stereotype of the rigid MIS professional will remain dominant. Furthermore, the end user will not feel ownership for the system, and it may not meet his business needs effectively.

End users who look down their noses at MIS may be satisfied with the "hired hand" solution. But it is unlikely that the consultant will feel satisfied. Again, the old concept of the MIS person as a technician will prevail.

TRW's Nunney

Consultants at the top of their profession strive for the role of "problem-solving partner." Filling these boots can shatter the traditional image of MIS for good.

But, of course, grooming professionals who can become problem-solving internal consultants is not as easy as designating an individual to be the end-user liaison or establishing a team to take on consulting roles. The best consultants are those who can dig deep into their technical expertise and provide a solution that is effective and in tune with business needs. Managers can encourage the development of professionals who straddle the line between business problems and technological solutions by increasing the exposure of their best people to other areas.

"People who have been rotated through various functional areas in the MIS community quickly develop strong consulting characteristics," Nunney says. "They get to see everything from programming to systems management and analysis to user interaction."

PART facilitator, part assertive interviewer, the problem-solving consultant must place his technical bias behind him and see things as much as possible from an end user's point of view.

Start with desire

The making of a consultant can begin with a professional's desire to work more closely with end users, or it can be encouraged by a manager who arranges movement between departments.

When internal consultants are not available from the technical side, they can be recruited by MIS from end-user departments. "Anyone who has been involved in sales and marketing picks up consulting skills, because they have to be good listeners and be analytical and responsive," Nunney says.

After starting out in sales and marketing, Nunney moved into consulting with a Big Eight accounting firm, making the transition from external to internal consultant at TRW.

John Hancock's Montgomery came to consulting from the MIS side. After graduating with a background in computer science, he worked as a systems analyst and then moved into consulting. Though his initial orientation was technical, Montgomery says he always knew he would not be the average computer professional.

"When I took my first course in Basic, the instructor said that if you want to go into computers, you have to be good at math. Math has always been the death of me," he says.

In the information center environment at John Hancock, Montgomery does not need strong math skills as much as interpersonal skills.

"The consultant who gets hired is the one the client understands and feels the most comfortable with. A lot of that is the way you project yourself, your sense of

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humor and your personal style," he says. "If you're very conservative, tight-tied and rigid in your chair, you're not going to inspire a warm feeling from the user."

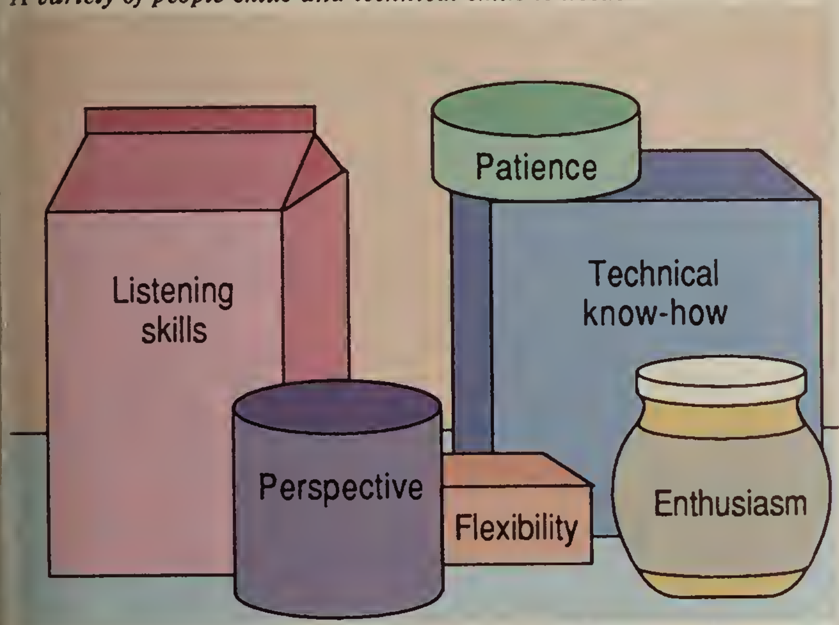
Instead, consultants should be relaxed and confident about their expertise yet honest about what they do not know.

Besides an accessible personality, would-be internal consultants also need to be able to learn from experience. For example, Phillip Colaluca, project manager in the telecommunications group at Avon Products, Inc. in Rye, N.Y., gained most of his skills through moving up in the company's information systems division. He began in the operations area, moved into an analytical position and then went into management.

"During the course of that, I picked up a lot of the consulting skills, like listening to people," he says. "I've also learned from past projects."

Recipe for a good consultant

A variety of people skills and technical skills is needed



CW CHART: AMY J. SWANSON

Aware of a gap

Workshops and seminars can also help internal consultants polish their skills by teaching them to organize their experiences into a conceptual framework.

For example, after attending such a seminar, Colaluca says he became aware of a gap in the way his group was approaching end-user applications. The technical staff was following the end users' requests, but it was not really listening to the client.

In one case, top management in charge of Avon's sales support group wanted a special telephone line and telemarketing unit to address "stranded customers" — those who did not have access to an Avon representative in their area. Sales management responded by saying they wanted 900 service — an interactive telephone service that allowed users to respond immediately to broadcast or printed messages regarding the products they wanted.

Eager to support the sales team — the source of 80% of Avon's income — Colaluca's group investigated the cost and feasibility of the service, examining case studies and vendors. They concluded that it might be too expensive, with little return for the organization. Rather than implement a complex response system, the company could meet the same need and pay much less by using an 800 number and an outside telemarketing firm to handle customer calls.

"We researched the request and not the reason for asking," Colaluca says. "We could have saved ourselves the work if we tried to find out what they wanted the service for. Just because a user has an idea doesn't mean he knows what he wants, and we found that out the hard way."

Now, with the benefit of experience, Colaluca knows better. But in addition, something called the HEAR model at a seminar offered by Arnoudse & Oullette cemented that knowledge and gave Colaluca a structured way to approach his next client.

The model's simplicity makes it easy to remember:

- "H" stands for accurately hearing the client's words. This means concentrating, eliminating distractions and avoiding attacks on the client's reasoning — even silently in your mind. Consultants should check how effectively they are carrying out the hearing step by paraphrasing and summarizing what the client says in his responses.
- "E" represents empathizing with the client's situation. The consultant needs to show interest in the client's point of view, even if his own point of view is different. Listening to "the music behind the words" or understanding the feelings as well as the context within which the client is operating is also helpful. The consultant should then make another accuracy check by paraphrasing what the client is saying.
- After hearing and empathizing, "A" stands for analyzing the user's problem based on the consultant's experience. The consultant should ask open-ended questions to help the client explore the situation and reveal all the facts. He can combine these with direct, probing questions to pin down the details of the problem. Next, the consultant walks the client through his analysis to form the basis for a shared understanding of the problem, which will later yield a shared commitment to a solution.
- The last stage, "R," simply means respond. After the client presents his situation, response from the consultant is vital to foster the relationship. The response should be connected to previous areas of mutual analysis and should be specific, filled with details on who needs to do what and when to solve the problem. Finally, the client should paraphrase the action described so that the consultant is sure the client understands what was said.

As basic as these points seem, one of the hardest things to do is reduce a complex problem — in which the goal is to bridge two worlds, business and technology — to simple, mutually agreed upon facts and understandings.

'Very helpful'

Since the seminar six months ago, Colaluca used the HEAR technique with an end user who wanted an international traffic study conducted.

"It was very helpful to verify things," he says. "The structured approach satisfied my client, and we agreed on things from the beginning. Now I won't have to go back 10 times for clarification."

Colaluca's next challenge is to install a large T1 network, encompassing eight Avon locations and working with five vendors, including IBM and AT&T. "I'm doing a lot of listening," he says.

Seeing computers as the end user sees them is a necessity in developing consulting skills, John Hancock's Montgomery says.

"In one project, we were going to automate areas that had no technology, and the staff was really suspicious of computer systems," he says. "We overcame that barrier by getting them involved on their level."

Instead of designating the project by its official title — the IDHS Group Conversions Unit — Montgomery nicknamed the project Garfield, after the well-known comic strip cat.

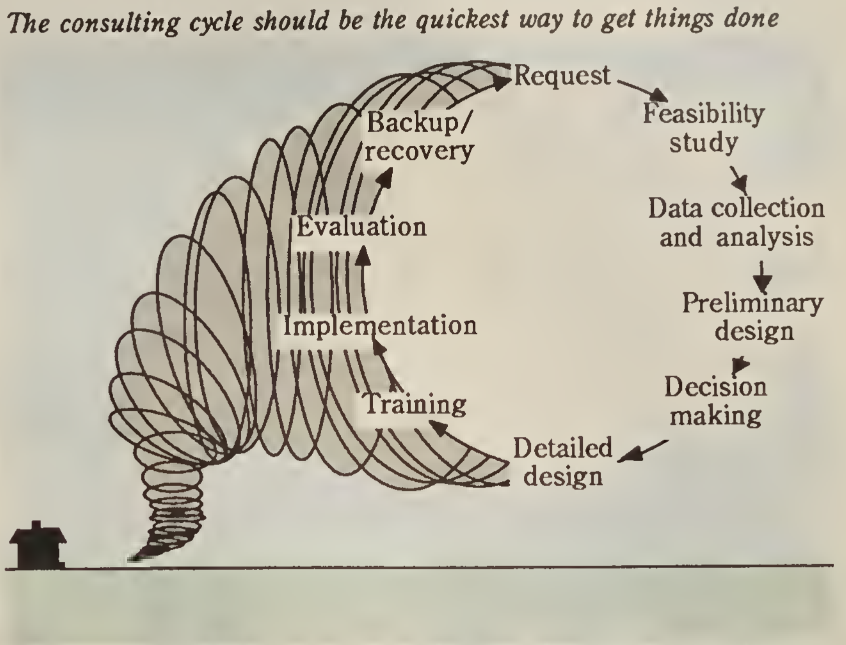
When the system was slow delivering printer output, Montgomery asked users to imagine Garfield, a fat, lazy feline, running from the terminal to the mainframe in the next building and back to the printer.

"They started to get the concept that we were dealing with wires and cables and systems, not magic," he says. "After a while, we were having fun with the system, and people felt more comfortable."

Other people skills were reawakened in him when he took a seminar on consulting skills. For example, Montgomery says, he found his desire to meet clients' needs sometimes led to an emotional reaction. "Even though you read all the books and understand all the skills, under fire you get a little emotional, especially when you are dealing with someone who is bullheaded," he says. "What do you do when they won't listen to common sense?"

White tornado

The consulting cycle should be the quickest way to get things done



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CW CHART

Turning it around

To avoid getting angry and releasing feelings that are not conducive to the consulting situation — as well as to refresh his memory — Montgomery now reviews his reading material before going to see a client. "These things have to be internalized, but it helps to have a reminder," he says.

TRW's Nunney also confronts uncooperative end users from time to time. "The MIS consultant should present a business perspective that says, 'While an individualized solution, such as a PC program, may be technically feasible, from a corporate business standpoint it might not make sense,' " he says.

Flexibility is often as important to the consultant as interpersonal skills and technical knowledge. "You have to have a high tolerance for frustration," Nunney says. "You operate in nebulous environments many times in which situations are not clearly defined."

There will be a future need for more experts to tread the no-man's-land between end users and MIS. The most powerful motivator for growth in this area may be strategic applications. A solid team of internal consultants who understand both the users' goals and information systems' capabilities are needed to make such systems a reality. •

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MANAGEMENT

TAKING CHARGE

James Connolly

Cost cutting revisited

The comparisons to the Industrial Revolution and the Space Age can be placed on hold for a while. The yellow caution flags are warning that the birth — or at least the prime — of the information age might be delayed by a few years.

One warning was issued recently by David G. Robinson, president of the Index Group, a Cambridge, Mass., consulting firm. During a speech at the Society for Information Management (SIM) Institutional Members conference in Florida, Robinson noted that an increasing number of MIS organizations are being confronted with belt-tightening mandates, usually as part of a companywide cost-cutting program and often because of the October stock market crash.

Robinson told about 250 SIM members that corporate budget restructuring often means that strategic information systems projects may be delayed for two or three years but that better times are likely after that period.

But what was refreshing was the positive twist Robinson added. It might have been easy for him to tell SIM's MIS directors and chief information officers to retrench to defend themselves

Continued on page 100

Consultants regroup

Shift focus as clients seek one-stop shopping

BY DAVID A. LUDLUM
CW STAFF

With information systems performing increasingly crucial functions for corporate America, consulting firms that specialize in helping companies plan their systems strategies are responding with their own interpretations of shifts in clients' needs.

Three leading firms — Index Group, Inc.; Nolan, Norton & Co.; and John Diebold & Associates, a division of the Diebold Group, Inc. — all lay claim to a focus on the development of strategic information systems. But the firms are taking different routes, particularly on the question of whether to augment planning with hands-on implementation through an in-house programming staff.

One dramatic move came 12 months ago when Nolan Norton, a 14-year-old Lexington, Mass., consulting firm, agreed to be acquired by Big Eight accounting giant Peat, Marwick, Main & Co.

Through the merger, Nolan Norton gained access to Peat Marwick's implementation resources and expertise in vertical markets, providing it with a broader range of services, according to cofounder Richard Nolan, a former Harvard Business School professor.

In creating systems that are vital to different firms' business strategies, it is increasingly important to understand industry issues and monitor implementation, Nolan says. "If you're unable to make the change happen in the organization, or an electronic distribution channel isn't working, we need to immediately replan," he says.

Nolan Norton has not been alone in moving in this direction. Although major systems consulting organizations have traditionally specialized in either planning or implementation, an increasing number of clients seek "one-

Continued on page 101

Data View

Get a job

Methods used in looking for a job, cited by 609 Computerworld *readers responding to a survey*

	Percent of respondents
Recruitment agencies	71.8%
Network of professional friends	68%
Classified ads in local paper	50.6%
Classified ads in trade publications	45%
Professional association gatherings	26.8%
Other	5.4%

INFORMATION PROVIDED BY CW PUBLISHING, INC.
CW CHART

Smith pumps Arco's MIS, staff's morale

BY JAMES A. MARTIN
CW STAFF

LOS ANGELES — After graduating from Detroit's Wayne State University in 1957 with a bachelor's degree in economics, Allen N. Smith moved to the booming Sun Belt city of Los Angeles to make his fortune as an auditor or an accountant.

Before long, however, Smith found himself on an unexpected career path: developing insurance systems on an IBM 650 mainframe.

In need of money, Smith, then 22, was awaiting offers from two potential employers — Bank of America, with an auditing position, and Occidental Life Insurance Co., with a systems analyst job. Smith had decided he would take the first offer that came his way. As fate would have it, Occidental called, and Smith was committed to a career in MIS.

No regrets

It was a decision Smith, now manager of Atlantic Richfield Co.'s corporate systems, has never regretted. In the top MIS position at one of the country's leading petroleum distributors, Smith oversees a staff of 70 people supporting some 1,100 users on 950 microcomputers and terminals with an annual budget of about $8 million.

In his career, Smith, 53, has gained extensive experience throughout the management, market research and systems areas. He also teaches at the University of California at Los Angeles school of management, has coauthored office automation and information management textbooks and recently served as chairman of the American Petroleum Institute's Information Systems Committee.

On top of all those activities, Smith is an avid reader, devouring two books a week, usually on management topics. Married with two children, Smith also keeps active by jogging and playing basketball.

By the age of 25, Smith had his first taste of management, moving to Security Pacific National Bank to head that company's programming and management efforts.

In 1964, Smith transferred to General Electric Co.'s computing division as a consulting sales specialist. Two years later, he joined Computer Sciences Corp. as a group manager. By 1972, Smith rose to director of financial systems, developing IBM

Continued on page 103

PROFILE

Allen N. Smith

Position: *Manager of corporate systems, Atlantic Richfield Co.*

Philosophy: *Train and treat people well and they will perform.*

MANAGERS ON THE MOVE

Franco named to America West Airlines post

Jorge Franco has been appointed vice-president of information systems at **America West Airlines** in Phoenix, where he will be responsible for a centralized data base system supporting all passenger services, operations and financial departments.

Franco had been director of applications at Piedmont Aviation, Inc. since 1984.

Prior to joining Piedmont, he spent 25 years with the former Sperry Corp., primarily in Sperry's international airline division.

America West Chief Executive Officer Edward R. Beauvais cited Franco's background in both the computer and airline industries as an asset for the company's senior management.

He majored in marketing and then earned a master's degree in business administration from Pace University in New York.

Codex Corp. recently named **Henry E. Morelli Jr.** vice-president for information systems and customer administration, with responsibilities for both domestic and international operations.

Morelli previously worked for Datapoint Corp. He was most recently employed by Intelogic Trace, Inc., where he was vice-president of MIS.

R. William Eaton Jr., chief information officer at **Levi Strauss & Co.**, has been elected a corporate vice-president of the firm. Eaton joined the company in 1978 and assumed his current role in 1987.

According to Levi Strauss Chief Operating Officer Thomas W. Tusher, Eaton has played a key role in the company's success in gaining industrywide agreement to standards that allow electronic links between suppliers, manufacturers and retailers.

Eaton majored in business at the University of Washington and received a master's degree in computer science from the U.S. Navy Postgraduate School.

Pitney Bowes Business Systems, a business unit of Pitney Bowes, Inc., has named **Dennis A. Jones** vice-president of MIS.

The Stamford, Conn., company said Jones will be responsible for the development of strategic direction and operation of all MIS services.

America West Airlines' Jorge Franco

Jones joined the company from Pitney Bowes subsidiary Dictaphone Corp., where he worked for 32 years and most recently was director of administrative services.

CALENDAR

MARCH 27-APRIL 2

International Congress on CIM Databases '88. Cambridge, Mass., March 27-29 — Contact: Kim Takita, CAD/CIM Alert, 824 Boylston St., Chestnut Hill, Mass. 02167.

ISSA '88. San Francisco, March 27-30 — Contact: Information Systems Security Association, P.O. Box 10246, Newport Beach, Calif. 92658.

The Candle Performance Conference. San Francisco, March 27-April 1 — Contact: Candle Education Registration Office, 1999 Bundy Drive, Los Angeles, Calif. 90025.

Interface '88. Chicago, March 28-31 — Contact: The Interface Group, Inc., Registration Department, 300 First Ave., Needham, Mass. 02194.

1st Annual World Congress on Computing (WCC). Chicago, March 28-31 — Contact: The Interface Group, Inc., Registration Department, 300 First Ave., Needham, Mass. 02194.

International Spectrum USA '88. Anaheim, Calif., March 29-31 — Contact: IDBMA, Inc., Suite 104, 9740 Appaloosa Road, San Diego, Calif. 92131.

Decus Rocky Mountain VAX Local Users Group Regional Conference. Denver, March 31-April 1 — Contact: RMVLUG, P.O. Box 13963, Denver, Colo. 80201.

APRIL 3-9

AUUA, Inc. (Unisys users) Spring Conference. San Diego, April 5-8 — Contact: Randal L. Leonard, Gay & Taylor, Inc., P.O. Box 1410, Winston-Salem, N.C. 27102.

PIMA Management Information Systems Conference. Savannah, Ga., April 6-8 — Contact: Scott Baumruck, Paper Industry Management Association, 2400 E. Oakton St., Arlington Heights, Ill. 60005.

APRIL 10-16

1988 EFTA Expo. Washington, D.C., April 10-13 — Contact: Jim Callan, Electronic Funds Transfer Association, Suite 1000, 1726 M St. NW, Washington, D.C. 20036.

22nd Annual ATA National Workshop and Computer Systems Demonstrations. Baltimore, April 10-13 — Contact: American Trucking Association Management Systems Department, 2200 Mill Road, Alexandria, Va. 22314.

8th IC&C Executive Forum. Washington D.C., April 10-13 — Contact: International Computers & Communications, P.O. Box 17392, Washington, D.C. 20041.

18th Conference on Computer Audit, Control and Security. Atlanta, April 10-15 — Contact: Program Chairman, EDP Auditors Foundation, P.O. Box 88180, Carol Stream, Ill. 60188.

Atre Forum on Relational Data Base & CASE. Washington, D.C., April 11-13 — Contact: Nancy Carafa, Forum Registrar, Atre International Consultants, Inc., P.O. Box 727, Rye, N.Y. 10580.

Facsimile & Image Communications Conference. Boston, April 11-13 — Contact: Cap International, Inc., One Snow Road, Marshfield, Mass. 02050.

Second Annual Logistics Conference and Technical Exhibit. Dallas, April 11-14 — Contact: American Production and Inventory Control Society, 500 W. Annandale Road, Falls Church, Va. 22046.

1988 AIIM Show. Chicago, April 11-14 — Contact: Association for Information and Image Management, Suite 1100, 1100 Wayne Ave., Silver Spring, Md. 20910.

The Relational Institute DB2 Product Fair. San Jose, Calif., April 11-15 — Contact: The Relational Institute, Suite 106, 6489 Camden Ave., San Jose, Calif. 95120.

Spring 1988 National Symposia and Workshops. Washington, D.C., April 11-22 — Contact: The National Institute for Software Quality and Productivity, P.O. Box 70555, Washington, D.C. 20088

International Programmable Controllers Conference. Detroit, April 12-14 — Contact: Michelle Marzahl, Engineering Society of Detroit, 100 Farnsworth, Detroit, Mich. 48202.

Cost Containment: The 1988 Imperative. Washington D.C., April 13 — Contact: Corey Green, The Yankee Group, 200 Portland St., Boston, Mass. 02114.

The Information Edge. New York, April 13-14 — Contact: Conference Registrar, The Conference Board, Inc., 845 Third Ave., New York, N.Y. 10022.

Connolly

CONTINUED FROM PAGE 99

against cutbacks and forget about preparing for the 1990s. Instead, Robinson predicted "tough but interesting times," and advised the attendees to anticipate cost-cutting mandates. He said a cost-cutting order or the possibility of one should be used as a tool to identify, build or tune strategic applications for the 1990s.

To use that tool, MIS must build a partnership with senior management, not middle management, because the strategic decisions will be made at the highest levels, Robinson said.

MIS must then identify those applications, either new or part of the installed base, that best support senior management's goals and focus resources on those applications.

As for the installed base of applications — the mushrooming monster that MIS must ever serve — Robinson noted that long-term savings can be found by making realistic cuts, at least in the area of enhancements. Such cuts may be needed if MIS is to add new applications during budget-crunching times.

What MIS must look at, according to Robinson, is whether the long-term benefits offered by old applications outweigh the benefits of new applications that better fit into senior management's plans.

Robinson predicted that those companies that face cutbacks today will be better prepared for the 1990s if they take a hard look at the installed base and the new applications and then shape their application inventory to support the company as it will look three years from now, not as it was three years ago.

Connolly is *Computerworld's* senior editor, management.

INDUSTRY WEEK/JULY 27, 1987

INVESTMENT

Northern Ireland works

"Can do" spirit is not PR hype.

By JOHN S. McCLENAHEN / Tragic as Northern Ireland's secular troubles are, no less tragic and unfair is the picture of Ulster that is perpetuated outside its borders.

The skirmishes between people and the police. The IRA raids. The killings. So widely disseminated are these images that a visitor expects to find Northern Ireland devastated by violence, a land at war with itself. An area where people are so consumed by hatred that cooperation is out of the question and uncivilness is the dominant human characteristic.

But these are great distortions, just as is the assumption that agriculture dominates economic activity in this Connecticut-sized stretch of budding-green land west of Britain. In fact, manufacturing creates fully 20% of Northern Ireland's gross domestic product. Construction contributes another 6.2%. And agriculture accounts for just 5.5%.

SATISFIED AMERICANS. Twenty-five U. S. companies—with $1.7 billion invested and 11,000 employees—are among the 140 international firms with subsidiaries in Northern Ireland.

These Americans are the likes of Ford and Du Pont. Of Hyster Co., the Portland, Oreg.-based producer of forklift trucks. Of AVX, a manufacturer of multilayer ceramic capacitors that has seen annual sales from its Ulster operations surge to $40 million from $4 million since 1979. The U. S. presence also includes Philadelphia's Paper Manufacturers Co., which is linked to Londonderry's Perfecseal Nuprint Ltd. in a specialty medical-packaging joint venture. These American firms are not merely existing. They are prospering.

JOB CREATION. Northern Ireland, indeed, is working. In the fiscal year that ended Mar. 31 its Industrial Development Board (IDB) recorded $390 million in new investments from abroad. These commitments are expected to create nearly 2,900 jobs.

Overall, IDB efforts last year attracted $513 million in investment commitments, an amount of money that should generate something close to 4,200 jobs. If IDB can keep the commitments coming and roughly double the rate of job creation (not an unrealistic prospect), unemployment in Northern Ireland could be cut in half at the end of five years, down to 10% from its current 20%.

In Belfast and Londonderry, Northern Ireland's two major cities, some battered and boarded-up buildings and the occasional inflammatory slogans stand testament to the continuing political tensions between Protestants and Catholics.

But in Londonderry, the less visibly
prosperous of the two cities, signs of
renewal are apparent—largely as a
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made by developer Paddy D
And in Belfast the best of a
Victorian city is be
new constru
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IDB
Northern
Ireland

Consultants

CONTINUED FROM PAGE 99

stop shopping" for both functions, according to John Moore, editor of *Systems Integration Age* (formerly *Computer Consultant*). "They're going to one firm that can do strategic systems planning — systems design and analysis and implementation," Moore says.

Like Nolan Norton, many general management consulting firms whose systems practices have concentrated on planning are adding implementation services, says Ed Hendricks, vice-president of the Association of Management Consulting Firms.

Meanwhile, the Big Eight accounting firms, which have traditionally addressed systems implementation, have been adding planning services, according to Jim Kennedy, editor of *Consultants News.* "Now they are trying to upgrade to offer more true management-level services. They all seem to be doing that," Kennedy says.

Index Group's Thomas Gerrity

Peat Marwick's acquisition of Nolan Norton was spawned when the accounting firm inquired about licensing Nolan Norton technology for planning systems, says Robert Gilges, formerly head of Peat Marwick's Information Technology unit and now a Nolan Norton partner charged with smoothing the merger process.

A CASE for integration

To help link planning with implementation, Nolan Norton wants to develop an automated computer-aided software engineering tool that could be used to generate systems from blueprints developed in the planning process, Gilges says. In addition to creating new systems, the technology would let organizations structure and re-engineer old code and data from changes in specifications.

The Index Group in Cambridge, Mass., is a systems planning specialist founded in 1967 that also characterizes its present focus as implementation of strategic systems, particularly those for sales, marketing and distribution.

In contrast to Nolan Norton's move, Index sold a systems development operation five years ago. Chairman Thomas Gerrity, a former MIT professor, says that sale reflected the view that clients should do much of the implementation of strategic systems themselves. "It's not the kind of implementation you'd want to hand over to an outside organization. We advise going outside when there's a highly structured expectation," he says. Index believes it can provide more objective advice on using implementation services if it does not offer its own, he adds.

Instead, Index emphasizes the managerial and organizational aspects of implementing systems. Company officials contend that implementation revolves less around programming than the organizational and behavioral changes that strategic systems call for.

Gerrity says Index focuses on "strong working partnerships" between MIS management and general managers, which it has backed through cross-functional research and advisory services such as its Alliance program for sales, marketing and MIS executives. "The theme is tighter and tighter integration between an MIS organization and a business organization," Gerrity explains.

Officials at Index and Nolan Norton say that compared with five years ago, they see less competition from John Diebold & Associates, an MIS management consulting firm. It is a division of the Diebold Group, which was founded in 1954 by John Diebold, author of the ground-breaking book, *Automation.*

Diebold's Theodore Freiser

Theodore Freiser, president of Diebold & Associates, says the firm focuses more on clients' specific concerns than do Index and Nolan Norton. He also characterizes the other firms as taking a more theoretical bent. "They have a lot of people from academia; they try to capitalize on that orientation."

Diebold has consciously eschewed providing implementation, although it considers organizational issues and offers project management, according to Freiser. He echoes Gerrity's concern that providing implementation might impair the objectivity of planning services. "You're called upon to make decisions that — if you do implementation — there's a business implication for your firm," he says.

Implementation also requires personnel, such as programmers, who are not interchangeable with business strategists and other planners, and there could be a temptation to use them where they do not belong during idle time, Freiser says.

Although Nolan characterizes his firm's merger with Peat Marwick as a strategic necessity, others say they expect technology users to continue to hire firms specializing in information systems planning.

"There will always be a place for the good niche players in management consulting — firms that can move quickly to fill a need," Hendricks says.

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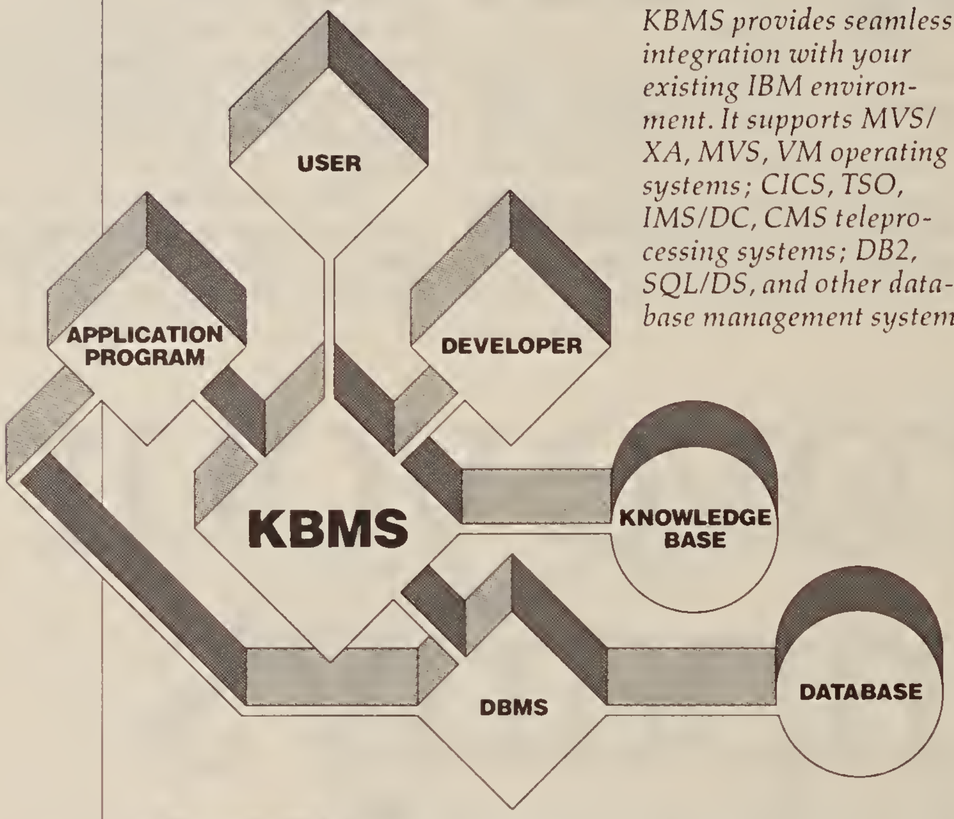

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CONTINUED FROM PAGE 99

370 on-line systems with complete budget responsibility. He left that year to join Arco.

Arco is currently decentralized into three information systems groups, which have a total annual budget of $240 million: oil and gas exploration, marketing and refining operations and corporate, which Smith heads.

Each group is responsible for its systems, which can range anywhere from an Apple Computer, Inc. Macintosh microcomputer to a Cray Research, Inc. supercomputer. At the center is the corporate information systems group, with three Hewlett-Packard Co. HP 3000 minicomputers.

People skills key to success

Smith's success, as described by his colleagues, is due to his self-improvement and ambition and to his ability to communicate with and manage a staff. "He's a very quiet, unassuming, modest guy, and when he gets mad, he takes it out on the computer console, not the computer operator," says Mike Solo, a free-lance data processing management consultant who has known Smith for 30 years.

Smith says people are "the first and most important thing. There's nothing we can't do with technology, but how we make it useful and how we communicate with people is the key."

"Al knows how to get the most out of his people," adds Don Medley, professor of computer information systems at California State Polytechnic University in Pomona. "He is good at developing strong working relationships and a believer in giving his people ideas of what he wants, the raw materials and letting them go to it."

Medley and Smith worked together planning the 1983 National Computer Conference that — with 97,216 attendees that year — was among the conference's biggest gatherings. "Allen was in charge of the technical program, meaning he worked with over 350 speakers and panelists, among other things," Medley recalls. "His capabilities in brainstorming, coming up with ideas for the conference, were extremely impressive."

As a manager, Smith's style "permits lots of democracy in the workplace," according to William D. Leake, vice-president of Arco's environmental protection group. To increase his staff's chances for advancement, Smith and his workers developed detailed job descriptions and a job-ladder program throughout the department.

"It gave everyone a good understanding of where you entered and led to some cross-fertilization of folks who could see more clearly how to move around in the company," Leake says.

For a man who strongly believes in supporting his people, Smith was faced with one of his biggest career challenges during the oil industry slump of 1985 and '86.

Arco's information systems budget was slashed from $330 million to $240 million and its staff from 2,400 to 1,600, affecting about 40 jobs in Smith's group.

Arco softened the blow by offering early retirement as an option. "If you are fair with your people and give them all the information they need and then let them choose, the bad effects are minimized," Smith says. "It was hard to keep productivity and morale up when this was going on, but we made it work."

The experience had its positive side, as well. "It's amazing how much more efficiently you can do things once you're forced to," Smith says. One streamlining mathod was to eliminate user chargebacks and the bookkeeping and processing that went along with them.

Another cost-saving measure Arco took was to discontinue the education seminars to teach end users about Arco's Information Services. Prior to the slump, Smith had initiated a series of seminars to educate users on technology and Arco's MIS plans as a way of promoting better understanding.

Those sessions were helpful in smoothing the sometimes rocky path between the end user and information systems, Smith says, so as soon as Arco's business — and budgets — stabilized, the seminars were resurrected.

The training sessions reflect Smith's basic management philosophy: train and treat your people well, and they will perform. If you get the best possible performance out of each employee, there is no such thing as a crisis, Smith says. "You've got to have good people, be fair with them and give them challenges, goals and objectives that test them. I want my people to be in deep water — but never over their heads."

> PEOPLE ARE "the first and most important thing. There's nothing we can't do with technology, but how we make it useful and how we communicate with people is the key."
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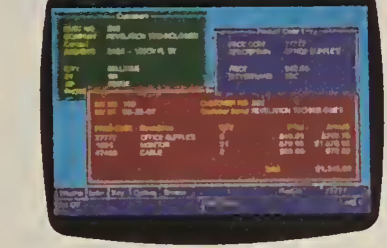

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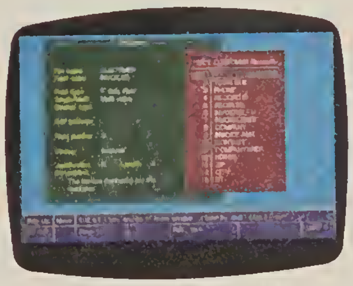

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COMPUTER INDUSTRY

INDUSTRY INSIGHT

Alan Alper

Hyper or just hype?

Computer industry companies, like those in other businesses, turn up the hype when market conditions get tough. In the high-performance computer business — which spans desktop workstations, minisupercomputers and supercomputers — the time is right for earmuffs: The hype has reached eardrum-splitting proportions.

You don't have to look too far for the reasons behind the low signal-to-noise ratio. Growth in the high-performance computer business has slowed somewhat after years of spectacular results. The minisupercomputer segment, in particular, has become extremely congested as a host of brash upstarts attempt to plug the price/performance gap between DEC's high-end VAX and the entry-level Cray.

Meanwhile, desktop supercomputing workstations are making their way onto the scene amid great fanfare and expectations. Start-ups Ardent and Stellar will join Apollo and Sun Microsystems in delivering desktop workstations with performance claims of 40 to 100 million instructions per second (MIPS).

Also fighting a war of words are Minneapolis crosstown rivals and supercomputer makers Cray and ETA Systems, which keep leapfrogging one another by extending the raw performance of their respective machines.

Oh yeah?

No wonder chest-beating and one-upmanship regarding whose machines are better, faster or cheaper has become the prevailing theme in this market. It's almost reminiscent of the child who boasts, "My daddy can whip your daddy!"

At the recent debut of Convex's new minisuper line in New York, for example, company chairman and venture capitalist L. J. Sevin proclaimed his firm had removed the "mini" from its minisupercomputer label. His contention was based on perfor-

Continued on page 107

EDS banks on Mtech buy-out

BY CLINTON WILDER
CW STAFF

DALLAS — In a move that would create a giant single provider of data processing services for banks, Electronic Data Systems Corp. (EDS) plans to acquire Mtech Corp. for approximately $350 million next month.

Mcorp, a bank holding firm based here, recently agreed to sell its 80.1% stake in Mtech to the General Motors Corp. DP unit for $281 million, roughly $50 million more than a previous bid by an investment partnership led by the Robert M. Bass Group [CW, Feb. 22]. Mcorp, hard hit by the Texas oil recession, had been seeking a buyer for the highly profitable Mtech unit in an effort to raise much-needed capital.

Mtech and EDS accounted for approximately $400 million in revenue from processing services for financial institutions in 1987. Mtech, with 1987 revenue of $206.7 million, is the leading provider of DP services to commercial banks; EDS leads the market serving credit unions and savings and loan companies.

The acquisition, the largest ever by EDS, is expected to be approved by the GM board at an April 15 meeting. EDS will offer $30 per share in cash and securities for Mcorp's stake in Mtech and will offer the option of $30 in cash or a combination of cash and securities to Mtech's other shareholders, EDS said.

Overlap predicted

Mtech will be merged with EDS's financial services division, but an EDS spokesman said it would be premature to comment on the potential structure of the merged firms. Some observers said there will be considerable overlap between the operations.

"They both do a lot of the same things," said M. Arthur Gillis, president of Computer Based Solutions, Inc. in New Orleans, a consultancy to MIS departments in small and medium-size banks. "They'll have a real opportunity to cut costs through significant merging."

About 35% of Mtech's bank processing revenue comes from Mcorp, and the companies said that relationship will continue after the merger.

The acquisition is a significant boost for EDS's efforts to expand its non-GM revenue stream [CW, Feb. 29]. "This is EDS's first big, bold move in that direction," said Stephen McClellan, a software and services analyst at Merrill Lynch Research. "They need to do two or three more deals like this, but this is a terrific start."

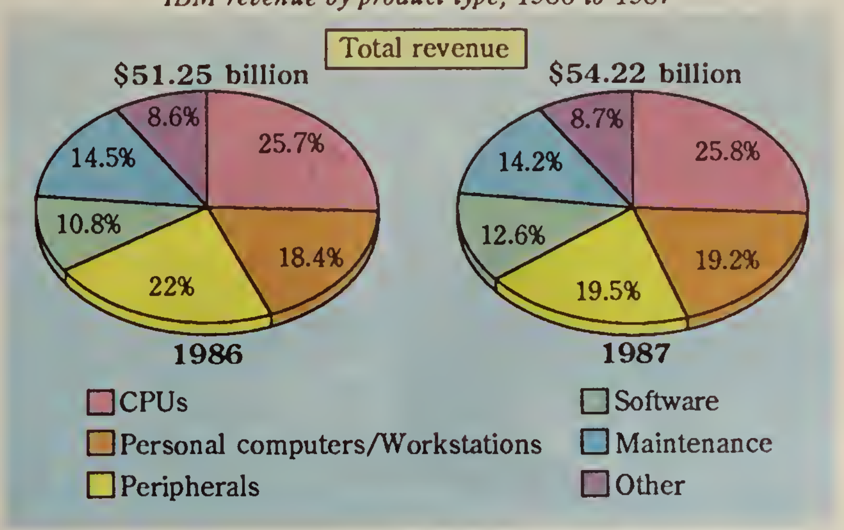
EDS derived 35% of its $4.44 billion in 1987 sales from customers other than GM.

But Gillis questioned the compatibility of the two corporate cultures. Mtech founder Darwin Deason "started a small company, played it his way, and Mcorp let him do that," Gillis said. "I'm not sure how that will mix with EDS, in the same way that [EDS founder] H. Ross Perot couldn't mix with GM. We'll see in the next 12 months."

Data View

Divvying up the Big Blue pie

IBM revenue by product type, 1986 to 1987



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Tech seeks toxics rules

BY J. A. SAVAGE
CW STAFF

In the first of two pending battles between Silicon Valley high-tech companies and their insurance carriers over hazardous waste cleanup, Advanced Micro Devices, Inc. (AMD) was ordered last month to pay $1.5 million for the cleanup of toxic chemicals at its Sunnyvale, Calif., fabrication plant.

Faced with multimillion dollar cleanup bills, the computer and

Continued on page 106

Atari sues over chip price hikes

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Atari Corp. last week filed suit against Micron Technology, Inc., its dynamic random-access memory chip supplier, charging that Micron's recent price increases are an "unlawful exploitation" of the current dynamic RAM shortages.

In the suit, Atari seeks unspecified damages for breach of contract, bad faith and violation of federal antitrust laws.

"It's a crazy situation," Atari President Sam Tramiel said in a prepared statement. "First, Micron pleads with the government to impose sanctions on the Japanese for selling low-cost dynamic RAM chips, then they raise their own prices to several times their cost of manufacturing the circuits. Instead of using the [government's] import restrictions in a positive way . . . Micron is destroying the competitiveness of the American microcomputer business."

In response to intense lobbying from U.S. chip makers, including Micron, the Reagan administration in 1986 cracked down on Japanese dynamic RAM suppliers for dumping chips into the U.S. market at predatory prices. In recent months, however, dynamic RAM chip shortages have been reported, partly as a result of increased demand. With those shortages, dynamic RAM prices have increased by as much as 300% in some cases.

The Atari suit, filed in U.S. District Court in San Jose, claims that Micron agreed to sell its

Continued on page 107

Morino recruits high-level Uccel execs

BY NELL MARGOLIS
CW STAFF

VIENNA, Va. — Want to work for Morino Associates, Inc.? First, get a job at Uccel Corp.

That appeared to be less a joke than a game plan last week as Morino Associates continued to lure high-level employees from the Dallas-based software house, acquired last year by Computer Associates International, Inc.

Earlier this month, former Uccel systems software executive Peter J. Barris was named president and chief operating officer of Morino Associates, with Mario Morino remaining chairman and chief executive officer. Last week, B. R. Perry, a 10-year veteran of Uccel who headed that company's $125 million systems software group prior to the Computer Associates takeover, signed on as vice-president of sales at Morino Associates.

The Uccel pedigree, Chairman Morino said, is largely coincidental, at least on the domestic front. With regard to rapid-fire expansion in the international sector, he said, "we make no bones about the fact that we're trying to replicate Uccel management." Morino Associates is an emerging rival of Computer Associates in the data center management software and services market.

More defections

Also last week, Richard E. Hanlon, Uccel's former director of investor and corporate relations, became Morino's first vice-president of corporate communications. A second new post, vice-president of corporate development, went to Morino Associates' director and head of sales and marketing, John A. DeWit, who is expected to be the firm's chief acquisition strategist.

"This is a recognition of our having to expand management in order to get ready for the kind of growth we're going to be facing," Morino said, referring to his ceding the president's job to Barris. "We went after the individuals in each of these cases," Morino said, pointing out that both Perry and Hanlon have had significant industry experience outside of Uccel.

Toxics

CONTINUED FROM PAGE 105

semiconductor industries and insurance companies are using the courts to define liability.

At issue is whether insurance policies cover non-sudden accidents. The slow leak of chemicals from a corroded tank may be accidental pollution, but it is a far cry from an earthquake-type accident, which insurance policies normally cover.

A few insurers used to issue policies that would cover environmental damage, but "the capacity doesn't exist for writing environmental impairment liability these days," said David R. Lane, attorney for AMD's second insurer, Allianz Underwriters, Inc. in Los Angeles.

A case involving Intel Corp. that may define what constitutes a sudden accident is currently pending in federal court in San Jose, Calif. In *Intel* v. *The Hartford Accident and Indemnity Co.* in Hartford, Conn., the insurance in dispute is a comprehensive general liability policy. In its filings, The Hartford has maintained that the contamination of soil and groundwater was not an accident.

The AMD case, however, turned not on the sudden nature of the pollution but on the more clear-cut issue of when AMD knew of the problem's existence. According to Ray Wong, attorney for AMD's insurer, Cincinnati-based American Empire Surplus Lines Insurance Co., AMD found out about a leak in an acid neutralization tank in July 1981 during a cleaning.

"The tank was corroded to the point it was so thin that the [cleanup worker] could put his finger through it. There was fluid outside the tank leaking back into the tank. The fluid was found to contain chlorinated hydrocarbons," Wong said.

Chlorinated hydrocarbons, used in the manufacture of semiconductors, are listed under the Environmental Protection Agency's Safe Drinking Water Standards as probable human carcinogens.

According to Wong, AMD signed the insurance policy a month after discovering the leak in the tank. AMD's attorney could not be reached for comment.

Intel has said its case has wide-ranging significance because it will affect other companies with similar claims.

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INDUSTRY WEEK IN BRIEF

Computer lessor **Capital Associates, Inc.** in Colorado Springs has stated that it is interested in making an unsolicited bid to acquire **NBI, Inc.**, a financially troubled Boulder, Colo., maker of office automation products, for a proposed $7 per share, or roughly $65 million. NBI, which has suffered eight consecutive losing quarters, laid off 200 employees last month. Capital Associates is the nation's sixth largest computer leasing company, with assets of about $500 million. NBI has annual revenue of about $280 million.

Filling a five-month vacancy, **AT&T's** Data Systems Group last week appointed a former IBM marketing executive to head its 1,000-member national computer sales organization. Gordon J. Bridge, 45, who was group director of IBM's U.S. Marketing & Services Group, joins AT&T as vice-president of national data sales and reports to Data Systems Group President Vittorio Cassoni.

The board of directors of **Compugraphic Corp.** has approved a merger with Netherlands-based **Agfa-Gevaert Graphics, Inc.**, a subsidiary of Agfa-Gevaert, Inc. Agfa-Gevaert Graphics already owns 83% of the outstanding shares of Wilmington, Mass.-based Compugraphic, which would retain its name under the arrangement. The merger must be approved by a two-thirds vote at a Compugraphic shareholders' meeting June 15. Compugraphic is a vendor of computer-based publishing systems and has annual revenue of about $350 million.

Conner Peripherals, Inc. has filed with the Securities and Exchange Commission for an initial public offering of five million shares of its common stock for about $45 million. The San Jose, Calif., maker of 3½-in. Winchester disk drives plans to price each share in the $8.50 to $9.50 range. Former Seagate Technology cofounder Finis Conner started Conner Peripherals in 1986.

IBM Vice-President James J. Forese has been named group executive of IBM World Trade Americas Group, which is responsible for IBM's operations in Canada, Latin America and the Caribbean. Forese succeeds IBM Vice-President Paul J. Kofmehl, who will retire this summer after 33 years with Big Blue.

Continental Information Systems Corp. (CIS) in Syracuse, N.Y., the second largest independent computer lessor, has acquired **Meszaros Associates, Inc.**, a 200-employee Buffalo, N.Y.-based professional services firm operating under the name Com-Pro. Terms were not disclosed.

Alper

FROM PAGE 105

mance projections of the four-processor version of the firm's new C series that put it in the same league as a Cray X-MP/14.

Later, Convex Chief Executive Officer Bob Paluck added that "supercomputers are no longer a luxury but a necessity." By this logic, so are personal jets.

Like all companies touting technological advantage, Convex credited its use of new 10,000 gate emitter-coupled logic (ECL) chips and 20,000 CMOS gate arrays as one of the reasons it could provide higher performance systems.

Going one better?

Yet as some companies adopt ECL technology, Cray claims that technology is not good enough. The firm is betting that gallium arsenide chips will enable it to design even higher performance systems.

At a recent New York high-performance computing symposium sponsored by Minneapolis investment firm Piper, Jaffray & Hopwood, ETA took issue with the Cray statement.

The firm's CEO, Carl Ledbetter, claimed that CMOS, ECL and gallium arsenide technology can all provide the same relative performance. Since all companies have access to the same technology, he said, the real issue is how to reduce implementation costs.

"The speed of light is the same in Armonk as it is in Tokyo and the same on both sides of the Mississippi," Ledbetter declared derisively.

While vendors are busy debating the virtues of various integrated circuit technologies, analysts are seeking new buzzwords to describe the high-performance computing market segment.

Gary Smaby, an analyst at Piper Jaffray, has come up with the term "hypercomputing." It encompasses a range of systems from MIPS-munching desktop workstations with high-resolution graphics to uniprocessors capable of performing both scalar and vector processing through parallel processors.

Smaby's coinage seems fitting, given the broad range of computing approaches and target markets. But with all the hype spewing forth, the only thing really hyper about high-performance computers is their marketers.

Alper is *Computerworld*'s Mid-Atlantic bureau correspondent.

Atari

FROM PAGE 105

chips for $3.75 each, a figure nearly triple its manufacturing costs, only to disown that contract in hopes of "commanding even higher prices."

A spokesman for Boise, Idaho-based Micron said the firm had just learned of the suit had no immediate comment.

Atari's suit comes on the heels of an announcement from AST Research, Inc. that stated AST must increase its microcomputer prices 10% to 15% as a result of increased dynamic RAM costs [CW, March 7].

"We empathize with Atari, but AST is not planning any legal responses of its own," said Mike Morand, AST's vice-president of systems marketing. The dynamic RAM shortage "could not have come at a worse time, when all of us were starting to become healthy again," he said. In addition, the Microsoft Corp.- and IBM-developed OS/2 operating system requires more memory, which will in turn increase the need for dynamic RAM chips.

Most analysts said they do not expect a rash of similar lawsuits. "There might be a few others, but my gut feeling is that this is more of a nuisance suit, without a lot of substance to it," said Dan Klesken, a semiconductor analyst for Montgomery Securities in San Francisco.

The shortage is exacerbated by fast growth in the business and, in some cases, bad planning, some observers said. Computer vendors "don't always anticipate wisely their own chip needs and don't give manufacturers enough lead time," said Mel Thomsen, a chip analyst at Dataquest, Inc.

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SA

Top jobs demand business sense

Being No. 1 takes industry know-how as well as management skills

BY JANET MASON
SPECIAL TO CW

It's no simple matter for companies to find the right candidate for a high-level MIS position. The ability to manage, plan and address industry issues and company concerns is more important here than technical skills.

Take the case of Bruce Simkins. He was relatively satisfied with his job as assistant vice-president of MIS at The New England when he was called by a recruiter from Winter, Wyman & Co. As a result, he moved into the top information systems position at Boston-based insurer Cameron and Colby Co.

Cameron and Colby was looking for a chief MIS person with a background in systems development and management — and who also understood MIS strategic planning. Simkins demonstrated this experience in interviews as well as an understanding of how the MIS department fits the needs of the insurance business.

Having been with The New England for 11 years and Massachusetts Mutual Life Insurance Co. before that, Simkins had learned the ins and outs of the industry. "The insurance industry is a complex business," he observes. "And the more I know about the business and how MIS meets those needs, the greater my chances become for success and leadership."

The new position requires Simkins to take a broader view of the business, compared with his old job, in which he only needed to understand the business side of particular applications. "I went from the ability to understand a piece of the business to knowing how MIS relates to the total picture," he says.

Not so lonely at the top

Now a vice-president, Simkins described how the new job entails more responsibility than lower level ones. "There is no other vice-president of MIS to have a rapport with," he says. "I can't say 'What would you do in this position?' because there is no other person making this type of decision." This increased challenge and responsibility attracts him, and so do the subsequent rewards.

Stewart French provides a second illustration of the qualities sought in a top MIS manager. As assistant vice-president of MIS with the Boston Financial Group, he watched fellow employees being laid off last year. The company asked him to step down and return to programming but also offered him the option of leaving with three months of severance pay and use of the office for word processing and telephone calls. "I took a deep breath, went home and discussed our finances with my wife and decided to start looking," French recalls.

> "ONLY A PERSON with a diversified background, excellent technical skills and an innate business sense fits this position. The person who was exposed to one module of the same system for 10 years just won't do."
>
> CAROL MASON
> CAREERS MANAGEMENT ASSOCIATES, INC.

He contacted several recruiting firms, one of which helped place him as director of a new MIS department at Cellular One in Boston, a Southwestern Bell cellular telephone company.

Before the 3-year-old firm hired French, it had been relying on a software consultant to handle information systems needs.

French landed the position because he demonstrated his facility with both the business and technical sides of the job. "In the interview, I discussed the company's relationship with the software consultant in terms of the company's needs," he says.

He discussed technical aspects, along with planning methods to meet the needs of the rapidly growing cellular company. "The finance director [who conducted the interview] valued the combination of technical and business needs," French says. The firm had been frustrated with the software consultants "because the business needs were not in the drivers seat — the computer needs were."

French chose the Cellular One job primarily because he could become part of the company's top management team. His decisions are considered for their impact on the overall business, he says. "It's nice to feel that I'm dealing with crucial issues to the business. My success in creating solutions is part of the total picture."

Another attraction is that the cellular industry and the firm itself are growing rapidly. "It's a new field," French says. "MIS cellular software systems didn't exist more than a year ago. I am defining new answers rather than accepting existing ones."

In addition, French has had the opportunity to create the new MIS department at Cellular One. "Since it was a new MIS department, I was able to define my own job," he says. "For one thing, I hired my own people rather than inheriting a staff from someone else." Hiring his own staff was important to French because he emphasizes intelligence and motivation. Long-term success depends on these characteristics, he says, rather than the knowledge of certain systems, on which most MIS directors focus.

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Executive recruiter Carol Mason, president of Careers Management Associates, Inc. in Bala Cynwyd, Pa., says candidates for top MIS jobs need "the right intangibles."

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"Only a person with a diversified background, excellent technical skills and an innate business sense fits this position," Mason says. "The person who was exposed to one module of the same system for 10 years just won't do."

Mason is a Philadelphia-based freelance journalist.

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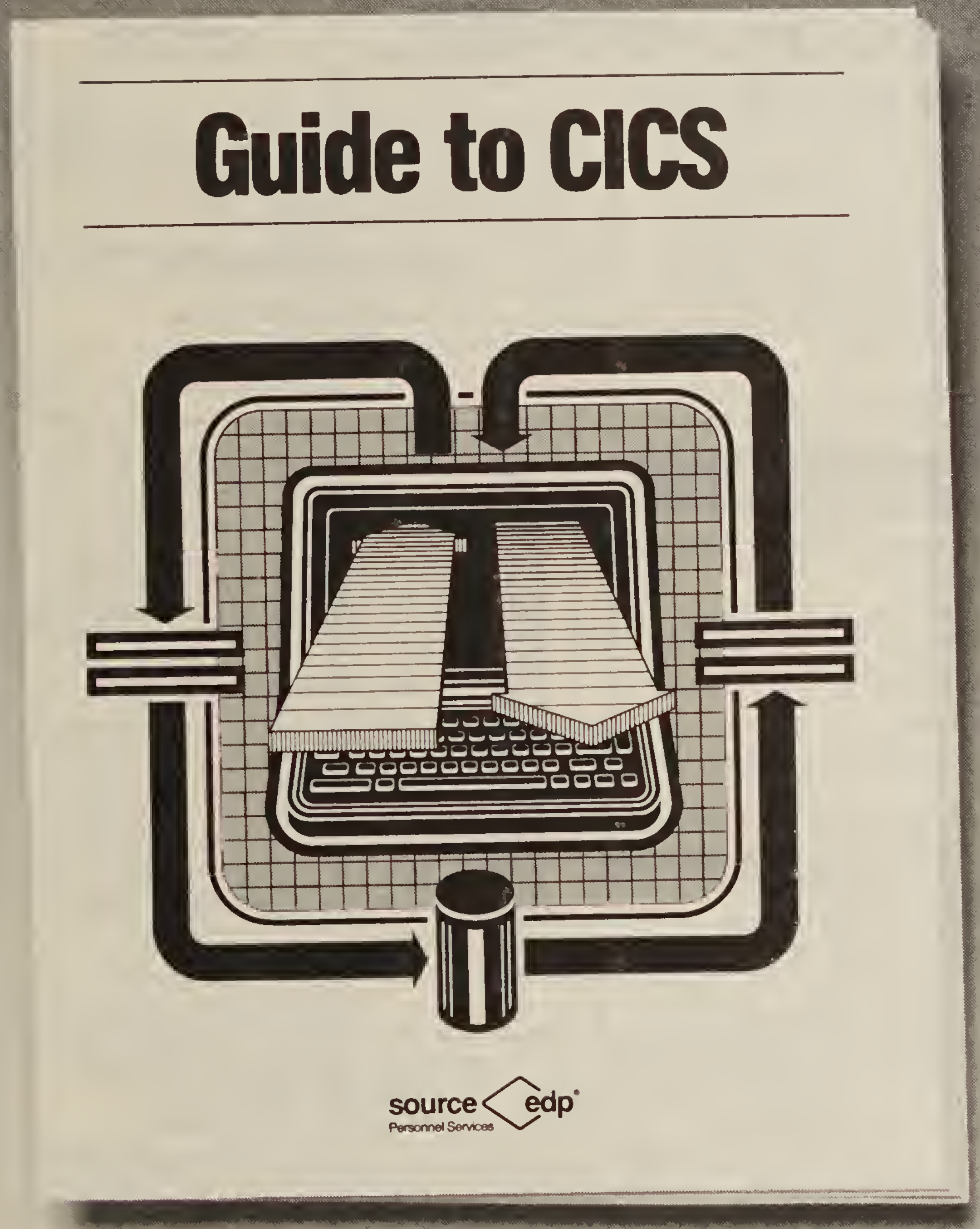

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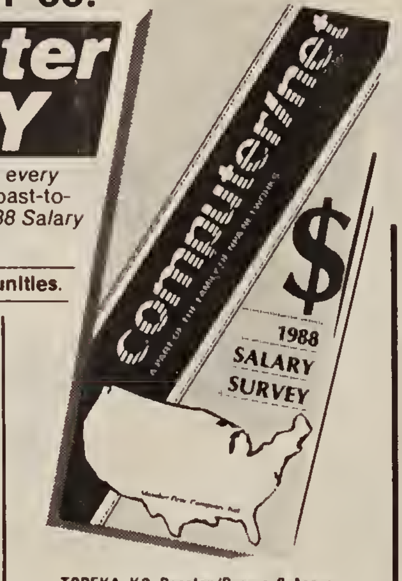

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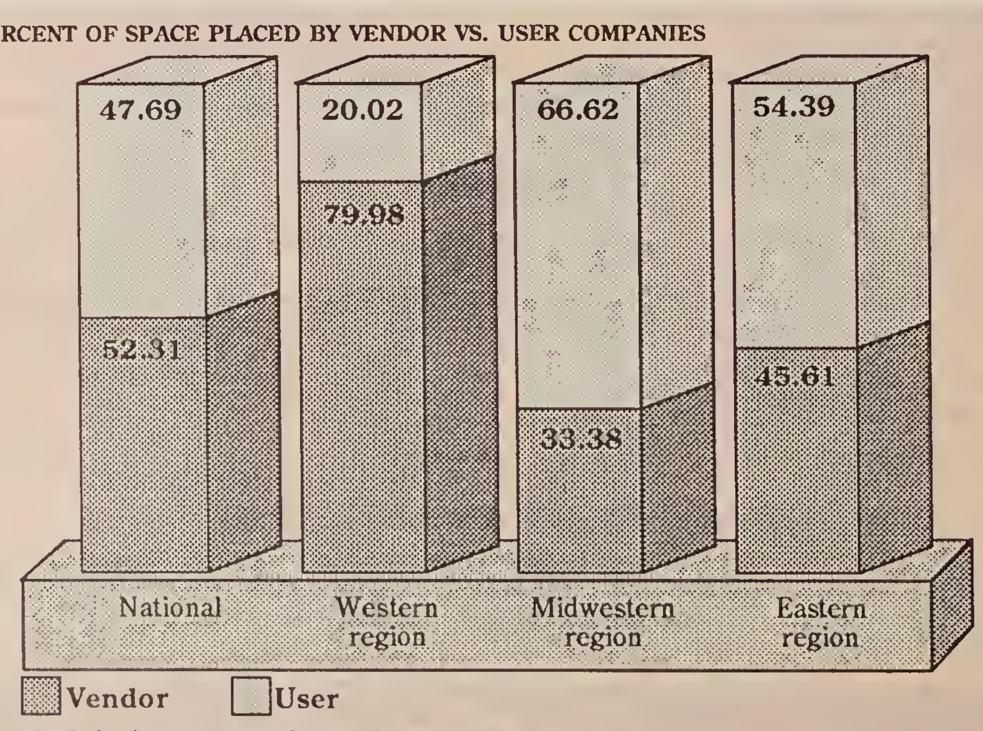
CAREER INDEX

January 1988 computer recruitment advertising activity*

PERCENT OF SPACE PLACED BY VENDOR VS. USER COMPANIES



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE

RESEARCH ASSISTANT

The MHD Energy Center at Mississippi State University has an opening for a Research Assistant to perform software development for diagnostic instrumentation being designed as part of a research effort in the field of magnetohydrodynamics (MHD) and other combustion processes. The position will involve the development of data gathering and analysis software and the operation of this software during field measurements. The position also entails modification of existing interactive data acquisition/analysis systems. Extensive travel to support field measurements is required.

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Starting salary, $25,000 to $30,000, will be commensurate with qualifications and experience. Tentative starting date for the position is May 1, 1988. Applications will be accepted until the position is filled. Send resume and addresses of two references to:

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MHD Energy Center
P.O. Drawer MM
Mississippi State University
Mississippi State, MS 39762
(601) 325-2105

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Computerworld
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Manager of Employment, #88-236
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Computer prices spring alive

As a new season begins, the used market looks to the sunny side

BY CAMERON HALL
BOSTON COMPUTER EXCHANGE CORP.

The spring bulbs are up and so are computer prices, as the warm weather brings everyone out. The secondary market is beginning to operate on a floor where discounted prices of new equipment no longer help determine prices of used equipment.

The buyers seem to have lost their market power: They are unable to find this IBM equipment elsewhere and are unwilling to commit to IBM's new Personal System/2s.

Market trading during the week ending March 11 continued to suffer from a shortage of IBM Personal Computer AT Model 339s, PC XT Model 089s, Apple Computer, Inc. Macintosh Pluses, Hewlett-Packard Co. Laserjets and Apple Imagewriters.

A sufficient quantity of the older PC AT, XT and Macintosh models filled buy orders at a steady pace for end users not yet ready to make the switch to the PS/2 or Apple's Macintosh II. Purchasing departments with PS/2s buy configurations among the Model 30 and 50 systems as buyers await the full bloom of OS/2, IBM and Microsoft's next-generation operating system.

The PC AT Model 339 closed up at the end of the week as savvy sellers quoted higher prices, but supplies shortened, and lingering rumors of large quantities about to be dumped on the market created uncertainty among buyers and sellers. The PC AT Model 339 closed up $100, at $3,450. The PC AT Model 099 also closed up, at $2,450, as buyers with the Model 339 on their shopping list settled for any IBM AT model.

> THE Macintosh continues to capture users' fancies. As one buyer said about his just-acquired Mac, "It's simply fantastic!"

PC XT trading volume picked up during the week as supply conditions continued to be good for the 10-MHz XT, and 20-MHz systems sold quickly. The XT Model 089 was up $50 to $1,800, while the XT Model 086 held its own, closing at $1,300.

Also up with the daffodils was the classic dual-floppy PC Model 076, which closed at $925, experiencing solid ground as a machine that continues to add value for end users.

Compaq Computer Corp. trading continued strong this week. Compaq models remaining on the "best sellers" list include the classic Portable I, which remained stable at $800. The Portable I gained market share against the IBM PC as the portables' lower price gave it the lead in dual-floppy systems.

Compaq's Portable II remained at $1,575, and the Portable III continued to sell for $2,750.

Early Compaq Deskpros did not fare well as unmet sell orders made sellers negotiate, and there were bargains to be had. Other Deskpro models performed better. The Deskpro 286 20-MHz model with mono-monitor closed up, at $2,400. Brisk trading of Deskpro 386 models brought selling prices down: The average price for the week was $3,600.

Apple season

Macintosh users seemed to be out in full bloom all week. Early bloomers found themselves waiting for the Mac Plus supply as prices crept higher and higher up to the recent high of $1,350. Those looking for the Mac 512E found the computers up slightly, at $1,025. The Mac II market needed sellers — that unit closed at $4,000 — while the Mac SE sold at $1,850.

The Macintosh continues to capture users' fancies. As one buyer said about his just-acquired Mac, "It's simply fantastic!" His deal included a half-price external Rodime, Inc. 20-MHz drive.

Those jumping from daisy-wheel to desktop publishing for their spring newsletters picked up HP Laserjets and raised prices briefly to $950. Watch for the Microsoft Corp. Mach 10 market to shift into warp speed as a bidding war brews over a bulk lot of these accelerators. They should appear in the retail market at a great price in a matter of days.

The Boston Computer Exchange can be reached at 800-BOCOEXX or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending March 11, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$925	$1,350	$700
XT Model 086	$1,300	$1,425	$1,150
XT Model 089	$1,800	$1,955	$1,000
AT Model 099	$2,450	$2,450	$1,950
AT Model 339	$3,450	$3,950	$2,400
Compaq Portable I	$800	$925	$650
Plus	$1,350	$1,400	$1,275
Portable III	$2,750	$3,000	$2,175
Deskpro Model 2	$1,600	$1,800	$1,600
Deskpro 286	$2,400	$2,475	$2,050
Deskpro 386	$3,600	$4,275	$3,600
Apple Macintosh 512	$825	$900	$650
512E	$1,025	$1,075	$800
Plus	$1,350	$1,550	$950
SE	$1,850	$2,400	$1,800
II	$4,000	$4,200	$3,500
DEC Rainbow 100+	$750	$900	$600
Hewlett-Packard Laserjet	$950	$1,000	$550
Toshiba T1100+	$1,100	$1,200	$900

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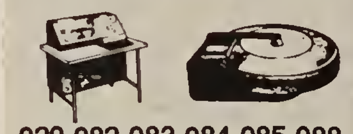

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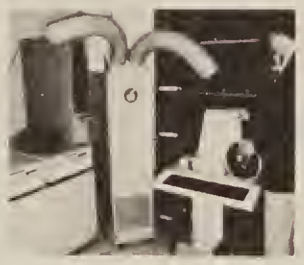

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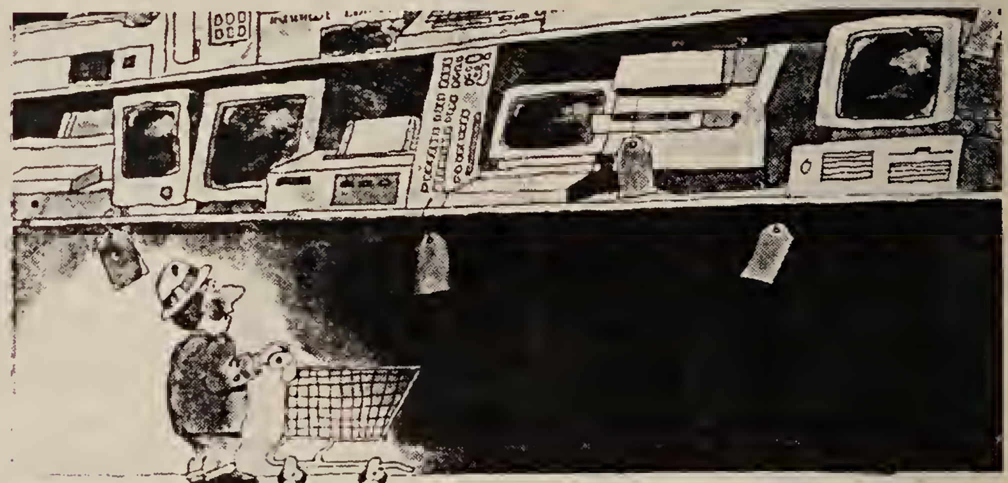

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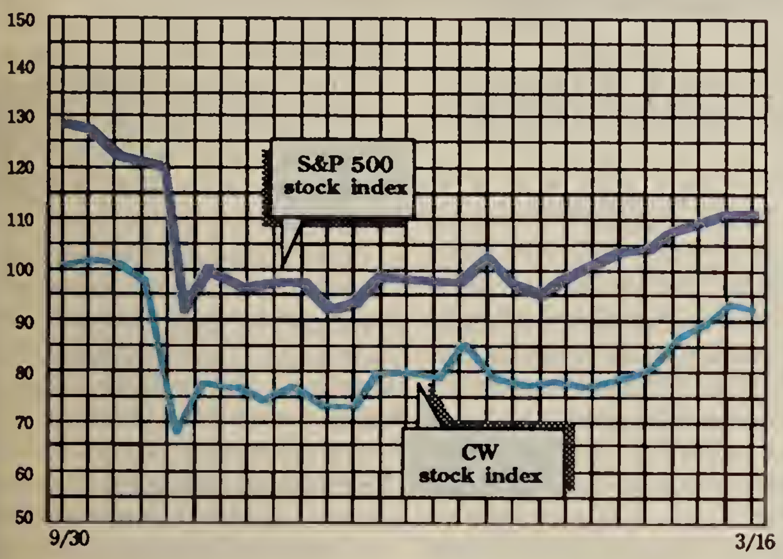

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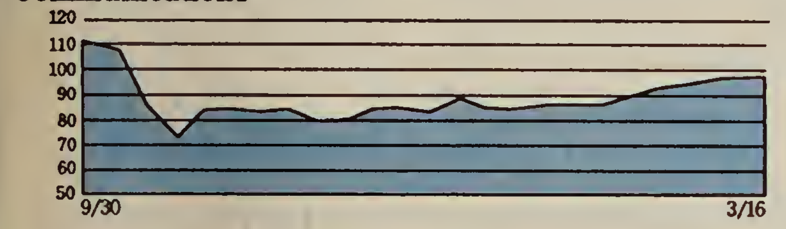
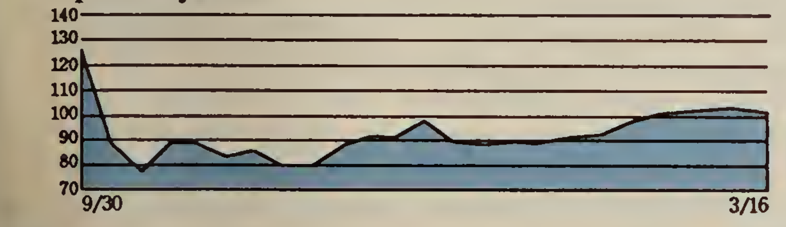
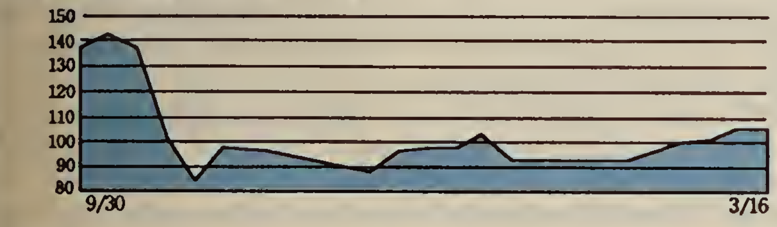


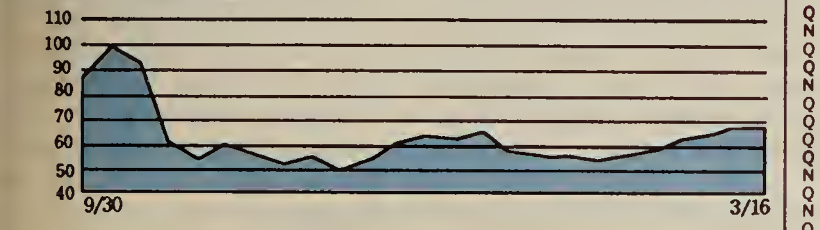
Computer Systems



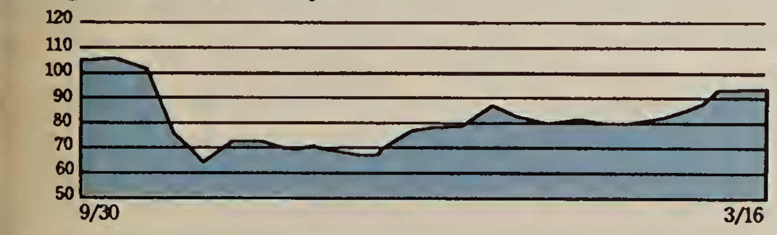
Software and DP Services



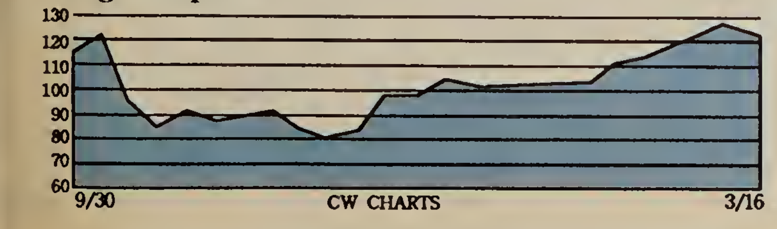
Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHARTS

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 16, 1988

Communications and Network Services

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	74	94.00	2.8	3.0
Q	ANDREW CORP	19	11	15.00	-0.3	-1.6
Q	ARTEL COMM CORP	4	2	2.25	0.5	28.6
N	AT&T	36	20	28.75	0.3	0.9
Q	AVANT GARDE COMP INC	6	2	1.69	-0.2	-10.0
Q	AVANTEK INC	18	6	7.50	-0.5	-6.3
N	AYDIN CORP	38	16	23.38	1.0	4.5
N	BELL ATLANTIC CORP	80	61	71.25	2.4	3.4
N	BELLSOUTH CORP	44	29	40.13	1.0	2.6
Q	COMPRESSION LABS INC	7	2	3.38	0.3	8.0
O	COMPUTER NETWORK TECH	6	1	1.41	-0.3	-16.6
O	CONTEL CORP	40	25	33.38	-1.1	-3.3
Q	DATA SWITCH CORP	9	4	8.63	0.3	3.0
Q	DIGITAL COMM ASSOC	49	20	34.13	-1.3	-3.5
Q	DYNATECH CORP	39	14	23.75	1.8	8.0
Q	FIBRONICS INTERNATIONAL INC	10	2	4.25	0.0	0.0
Q	GANDALF TECHNOLOGIES	11	5	7.38	0.1	1.7
Q	GENERAL DATACOMM INDS	14	3	4.38	0.0	0.0
N	GTE CORP	45	29	38.50	0.4	1.0
Q	INFOTRON SYS CORP	12	5	9.00	0.0	0.0
N	ITT CORP	66	42	46.25	-0.6	-1.3
N	M A COM INC	16	7	10.50	0.4	3.7
Q	MCI COMMUNICATIONS CORP	12	6	11.13	0.0	0.0
Q	MICOM SYS INC	17	7	11.88	-0.6	-5.0
Q	NETWORK SYS CORP	18	7	9.13	-0.6	-6.4
N	NORTHERN TELECOM LTD	24	14	19.25	-0.4	-1.9
Q	NOVELL INC	30	12	22.75	0.5	2.2
N	NYNEX CORP	78	58	69.00	2.0	3.0
N	PACIFIC TELESIS GROUP	34	9	29.50	1.3	4.4
N	PARADYNE CORP	9	4	5.38	-0.1	-2.3
A	PENRIL CORP	6	1	4.13	-0.1	-2.9
N	PLESSEY PLC	41	23	29.25	-1.8	-5.6
N	SCIENTIFIC ATLANTA INC	20	8	15.88	0.9	5.8
N	SOUTHWESTERN BELL CORP	46	22	37.88	1.0	2.7
Q	3 COM CORP	26	12	22.75	-0.6	-2.7
N	TIMEPLEX INC	40	17	32.25	0.0	0.0
Q	UNGERMANN BASS INC	16	5	12.38	0.1	1.0
N	U S WEST INC	60	43	54.00	0.1	0.2

Computer Systems

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	37	5	8.00	-0.3	-3.0
Q	ALPHA MICROSYSTEMS	6	3	4.31	0.1	1.5
Q	ALTOS COMPUTER SYS	16	9	11.13	-1.1	-9.2
A	AMDAHL CORP	50	19	37.00	0.6	1.7
Q	APOLLO COMPUTER INC	25	9	15.50	-0.8	-4.6
Q	APPLE COMPUTER INC	60	28	46.13	-0.6	-1.3
N	BOLT BERANEK & NEWMAN	28	12	15.25	0.3	1.7
Q	BRITTON LEE INC	5	1	2.38	0.3	11.8
N	COMPAQ COMPUTER CORP	79	26	53.50	-1.6	-2.9
Q	COMPUTER AUTOMATION INC	17	5	10.50	-2.0	-16.0
A	COMPUTER CONSOLES INC	11	2	5.13	0.1	2.5
Q	CONCURRENT COMP CORP	24	11	16.75	-0.5	-2.9
N	CONTROL DATA CORP DEL	38	18	28.50	0.5	1.8
Q	CONVERGENT TECH	11	3	3.56	-0.5	-12.3
Q	CONVEX COMPUTER CORP	22	6	8.63	-1.4	-13.8
N	CRAY RESH INC	136	47	83.00	-3.4	-3.9
Q	DAISY SYS CORP	11	5	8.63	-0.3	-2.8
N	DATA GEN CORP	37	16	24.88	-1.6	-6.1
N	DATAPOINT CORP	9	3	4.38	0.4	9.4
N	DIGITAL EQUIP CORP	200	110	117.63	-2.9	-2.4
N	FLOATING POINT SYS INC	15	3	4.75	0.4	8.6
N	GOULD INC	34	8	12.50	-0.5	-3.8
N	HARRIS CORP	43	22	29.88	0.9	3.0
N	HEWLETT PACKARD CO	74	36	65.00	0.5	0.8
N	HONEYWELL INC	91	49	66.75	0.4	0.6
N	IBM	176	102	115.25	-1.4	-1.2
Q	INFORMATION INTL INC	16	9	12.25	-0.3	-2.0
Q	IPL SYS INC	3	1	1.88	0.0	0.0
Q	MASS COMPUTER CORP	14	5	4.75	-0.5	-9.5
N	MATSUSHITA ELEC INDL LTD	207	93	206.50	5.8	2.9
Q	MEGADATA CORP	6	3	3.75	0.1	3.4
Q	MENTOR GRAPHICS CORP	39	14	27.00	-1.0	-3.6
N	NBI INC	14	4	6.63	0.3	3.9
N	NCR CORP	87	50	60.88	-5.0	-7.6
N	PRIME COMPUTER INC	31	12	16.88	-0.5	-2.9
Q	PYRAMID TECHNOLOGY	12	5	11.00	-0.1	-1.1
Q	STRATUS COMPUTER	41	15	29.00	1.0	3.6
Q	SUN MICROSYSTEM INC	46	14	34.63	-0.4	-1.1
Q	SYMBOLICS INC	6	1	1.38	0.0	0.0
N	TANDEM COMPUTERS INC	38	17	20.63	-1.5	-6.8
N	TANDY CORP	57	28	41.25	1.0	2.5
N	ULTIMATE CORP	37	13	15.25	-0.1	-0.8
N	UNISYS CORP	48	24	34.50	-2.0	-5.5
A	WANG LABS INC	19	10	12.88	-3.5	-21.4

Software & DP Services

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ADVANCED COMP TECH	6	1	1.88	-0.1	-6.3
N	AGS COMPUTERS INC	30	11	18.00	0.5	2.9
Q	AMERICAN MGMT SYS INC	20	9	16.13	-1.1	-6.5
Q	AMERICAN SOFTWARE INC	22	6	13.00	-0.8	-5.5
N	ANACOMP INC	11	4	8.50	-0.5	-5.6
Q	ANALYSTS INTL CORP	10	4	7.38	-0.1	-1.7
Q	ASHTON TATE	33	13	30.50	0.5	1.7
Q	ASK COMPUTER SYS INC	16	6	13.50	-1.3	-8.5
Q	AUTODESK INC	34	12	25.00	-0.3	-1.0
N	AUTO DATA PROCESSING	55	16	45.25	-1.8	-3.7
Q	BOOLE & BABBAGE INC	12	5	8.25	0.3	3.1
N	COMPUTER ASSOC INTL INC	37	15	30.63	-1.1	-3.5
Q	COMPUTER HORIZONS CORP	15	7	9.88	0.0	0.0
N	COMPUTER SCIENCES CORP	73	42	49.00	-1.8	-3.4
N	COMPUTER TASK GROUP INC	17	9	11.00	0.0	0.0
Q	COMSHARE INC	28	12	16.63	-1.4	-7.6
N	CULLINET SOFTWARE INC	14	4	7.50	-0.5	-6.3
Q	CYCARE SYS INC	10	6	7.88	0.0	0.0
Q	DUQUESNE SYS INC	33	10	20.25	-0.5	-2.4
A	DATA ARCHITECTS INC	17	7	13.63	0.0	0.0
N	GENERAL MTRS (CLS E)	51	30	42.13	-1.5	-3.4
Q	HOGAN SYS INC	17	5	5.38	-0.5	-8.5
Q	INFORMIX CORP	31	12	21.25	1.0	4.9
Q	INTELLICORP INC	11	2	3.75	0.1	3.4
Q	KEANE INC	10	6	9.00	1.0	12.5
Q	LOTUS DEV CORP	40	19	31.00	-1.8	-5.3
Q	MANAGEMENT SCI AMER	19	6	6.88	-0.5	-6.8
Q	MICRO PRO INTL CORP	8	3	3.50	-0.1	-3.4
Q	MICROSOFT CORP	79	37	64.75	0.8	1.2
Q	MORINO ASSOCIATES INC	24	7	16	-0.6	-3.9
Q	NATIONAL DATA CORP	34	19	31.00	3.8	13.8
Q	ON LINE SOFTWARE INTL INC	22	9	13.63	0.9	6.9
Q	ORACLE SYS CORP	19	8	16.50	-0.3	-1.5
N	PANSOPHIC SYS INC	28	11	17.50	-0.6	-3.4
Q	POLICY MGMT SYS CORP	30	15	25.00	-0.5	-2.0
Q	PROGRAMMING & SYS INC	14	7	12.50	0.3	2.0
Q	REYNOLDS & REYNOLDS CO	39	14	21.50	-1.0	-4.4
Q	SEI CORP	18	10	16.88	0.5	3.1
Q	SHARED MED SYS CORP	37	19	25.50	0.3	1.0
Q	SOFTWARE AG SYSTEMS INC	14	7	11.25	0.0	0.0
Q	SOFTWARE PUBG CORP	17	5	13.75	-0.3	-1.8
A	STERLING SOFTWARE INC	13	6	8.38	0.0	0.0
Q	SUNGARD DATA SYS INC	21	10	16.50	-0.3	-1.5
Q	SYSTEMATICS INC	31	19	30.75	3.3	11.8
N	SYS. SOFT INC.	24	7	17	1.0	6.2
Q	VM SOFTWARE INC	45	7	13.75	1.6	13.4

Semiconductors

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	25	8	12.25	-1.0	-7.5
N	ANALOG DEVICES INC	24	8	15.00	0.3	1.7
Q	ANALOGIC CORP	13	5	7.50	0.3	3.4
Q	INTEL CORP	42	18	31.00	-0.6	-2.0
Q	LSI LOGIC CORP	17	7	10.38	-0.4	-3.5
N	MOTOROLA INC	74	35	47.13	-3.9	-7.6
N	NATL SEMICONDUCTOR	22	10	11.75	-0.6	-5.1
N	TEXAS INSTRS INC	80	36	55.25	0.3	0.5
A	WESTERN DIGITAL CORP	33	11	16.00	0.5	3.2

Peripherals

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP.	13	3	4.50	-0.5	-10.0
N	AM INTL INC	9	3	4.38	0.4	9.4
Q	AST RESH INC	21	6	10.25	-0.6	-5.7
Q	AUTO TROL TECH CORP	9	3	5.50	-0.3	-4.3
Q	BANCTEC INC	16	5	7.75	0.0	0.0
Q	CIPHER DATA PRODS INC	16	4	8.88	0.0	0.0
A	COGNITRONICS CORP	5	2	3.50	0.4	12.0
N	COMPUGRAPHIC CORP	28	19	25.88	2.6	11.3
N	COMPUTERVISION CORP	21	7	7.00	0.0	0.0
A	DATAPRODUCTS CORP	24	7	10.13	0.6	6.6
A	DATARAM CORP	9	5	6.38	0.1	2.0
N	DECISION INOS CORP	13	4	10.75	0.0	0.0
N	EASTMAN KODAK CO	71	40	43.00	0.1	0.3
Q	E M C CORP MASS	29	10	17.00	-1.4	-7.5
Q	EMULEX CORP	9	4	8.25	0.3	3.1
Q	EVANS & SUTHERLAND	40	18	19.75	-1.5	-7.1
Q	ICOT CORP	13	3	5.00	-0.3	-4.8
Q	INTERLEAF INC	24	11	20.50	1.0	5.1
Q	IOMEGA CORP	5	1	2.81	-0.1	-2.2
Q	LEE DATA CORP	9	3	3.88	0.1	3.3
Q	MASSTOR SYS CORP	6	1	2.50	0.4	17.6
Q	MAXTOR CORP	33	6	14.50	-0.5	-3.3
Q	MICROPOLIS CORP	44	13	27.00	-2.1	-7.3
Q	MINISCRIBE CORP	18	5	10.63	-1.1	-9.6
N	MINNESOTA MNG & MFG CO	84	45	63.13	4.8	8.1
A	MSI DATA CORP	29	12	27.00	-1.1	-4.0
Q	PRIAM CORP	6	1	2.00	-0.5	-20.0
Q	PRINTRONIX INC	13	7	9.88	0.3	2.6
N	QMS INC	27	8	11.75	0.3	2.2
Q	QUANTUM CORP	32	8	12.75	1.0	8.5
Q	RAMTEK CORP	6	2	4.00	0.0	0.0
N	RECOGNITION EQUIP INC	22	7	9.25	-0.4	-3.9
Q	REXON INC	14	5	8.38	0.0	0.0
Q	SCAN TRON CORP	14	7	13.25	1.0	8.2
Q	SEAGATE TECHNOLOGY	46	10	22.25	0.6	2.9
N	STORAGE TECH CORP	5	1	1.88	0.0	0.0
Q	TANDON CORP	7	1	1.88	0.0	0.0
A	TEC INC	7	3	5.00	0.5	11.1
N	TEKTRONIX INC	41	21	28.75	0.0	0.0
Q	TELEVIDEO SYS INC	3	1	1.13	-0.1	-10.0
N	TELEX CORP	94	30	50.63	-0.4	-0.7
Q	WYSE TECH	40	11	21.00	-1.6	-7.2
N	XEROX CORP	85	50	56.88	-1.5	-2.6
Q	XIDEX CORP	16	6	6.25	-2.1	-25.4

Leasing Companies

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE MARCH 16 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	5.75	0.0	0.0
N	COMDISCO INC	37	12	22.50	-1.3	-5.3
N	CONTINENTAL INFO SYS	14	5	8.88	-0.1	-1.4
Q	PHOENIX AMERN INC	6	2	3.00	-0.3	-7.7
Q	SELECTERM INC	6	3	3.75	-0.3	-6.3

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Unkind cut

DEC an unfortunate wild card in positive Wall Street shuffle

There are always exceptions to the rule, and Digital Equipment Corp. was the victim in a big way in a bullish New York Stock Exchange last week. While the Dow Jones industrial average was hitting another post-crash high of 2086.04 as of Thursday's close, DEC was citing lower than expected orders of large systems and reducing its third-quarter earnings forecasts for the second time in as many weeks. The Maynard, Mass., giant got hammered on Thursday, when it lost 5⅜ points and finished the four days of trading down 7⅝ points to 112¼.

But all was not storm clouds on the Street. Tandy Corp. jumped 2⅜ points on the heels of its announcement that it will buy laptop maker Grid Systems Corp. and finished up at 41¾. Control Data Corp. also did well, gaining 2⅛ points to close at 29.

Other, more modest, gainers included Novell, Inc., up 1¾ points to 22¾; Microsoft Corp., up 1⅜ points to 63⅞; and Ashton-Tate Corp., up 1 point to 30. Slight slippage was experienced by NCR Corp., down 1⅝ points to 61⅜; Tandem Computers, Inc., down 1 point to 30; and Apple Computer, Inc., down ¾ of a point to 45.

JAMES DALY

DCA serves up plate of OS/2 connections

BY JAMES DALY
CW STAFF

NEW YORK — Digital Communications Associates, Inc. (DCA) last week introduced the first in a line of products intended to provide both OS/2-based terminal-to-host connection and a smooth DOS-to-OS/2 transition path.

Additionally, the Alpharetta, Ga., communications equipment maker confirmed that it will license Microsoft Corp.'s OS/2 LAN Manager, offering it both separately and in conjunction with the newly announced DCA Select OS/2 Communications Server, or Select CS.

Select CS is the latest venture into the still largely uncharted connectivity territory of OS/2, jointly developed by Microsoft and IBM. The server picks up where the micro-to-micro connectivity of the LAN Manager leaves off by allowing personal computers on a local-area network to access information on the host computer.

Some analysts called the product the first alternative to the Communications Manager portion of IBM's OS/2 Extended Edition. Users could then purchase presumably less expensive and possibly enhanced Extended Edition capabilities, including Communications Manager features, from third parties, as opposed to purchasing proprietary software from IBM.

Alternate route?

"Companies like DCA and Microsoft are trying to offer industry-standard solutions, and we think this is the way users want to go," said Mary Ann Bartels, a research associate with J. C. Bradford & Co. in Nashville. "It could be a very effective alternative to the Extended Edition and the Communications Manager."

Thomas White, president of Santa Clara, Calif.-based research firm Infonetics, Inc., conceded that DCA's OS/2 connectivity strategy is "pretty ambitious" but said he will take a wait-and-see attitude.

The turnkey Select CS includes a DOS client workstation on a network, a DOS stand-alone workstation that does not go through the server but connects directly to the host and a similar arrangement with an OS/2 client and stand-alone workstations.

The company also announced the DCA Select MS OS/2 LAN Manager, or Select LM, a product based on the LAN Manager that is said to allow both DOS and OS/2 client workstations to share the server's resources.

Availability for both products is scheduled for first-quarter 1989, with pricing structured according to the number of concurrent workstations using the product.

An entry-level server supporting up to eight concurrent users with up to five sessions per user will reportedly cost less than $3,000. Select LM is set to be available on a server basis for less than $3,000 per server, with each server licensed for an unlimited number of workstations.

Duquesne raided for Uccel files

BY ALAN ALPER
CW STAFF

VIENNA, Va. — Local authorities here last week seized confidential documents allegedly taken by two former Uccel Corp. employees who joined rival systems software company Duquesne Systems, Inc. late last year.

The search and seizure was ordered by a Virginia circuit judge in conjunction with a suit brought by Computer Associates International, Inc. subsidiary Uccel.

In the suit, Uccel is seeking to recover confidential documents that were allegedly misappropriated by two former employees of the firm's McLean, Va.-based office.

Uccel and Computer Associates are requesting unspecified monetary damages, court fees and further relief as determined by the court, according to the complaint.

Uccel is charging former employees James Holland and Kenneth Smart with taking confidential customer account reports, company handbooks and product information when they left the company to join Duquesne's Vienna-based sales office last December.

The complaint alleged that Smart and Holland breeched their employment contracts by circulating Uccel documents to members of Duquesne's sales force.

Sales theft charged

Uccel contends the documents are enabling Duquesne to capture sales from it and its parent, Computer Associates.

Duqusene competes with both Uccel and Computer Associates in a variety of systems software areas, including direct-access storage device performance, network management, job accounting and unintended operations.

Spokesmen for Computer Associates and Duquesne declined comment. A hearing date has not yet been set.

AST keeps pace with OS/2 strategy

BY PATRICIA KEEFE
CW STAFF

IRVINE, Calif. — In a statement of direction issued last week, AST Research, Inc. became the second vendor in a week to challenge IBM head-on by announcing its intent to offer "the same kind of functionality" provided by IBM under OS/2 Extended Edition.

AST's goal is to offer "100% AST-coded products" that provide all the capability of Extended Edition's Communications Manager, said Michael Krieger, manager of the firm's Advanced Products Group in Data Communications. Users would combine this technology with OS/2 Standard Edition and, most likely, Microsoft Corp.'s Presentation Manager, he added.

"Instead of forcing a single, expensive operating system down everybody's throat . . . we've decided to take a modular approach with pieces that fit together like a big OS/2 jigsaw puzzle," Krieger said.

Users would need to purchase only modules that fit their communications needs, AST said. Thus, a System/36 or 38 shop would not have to buy the IBM 3270 portion.

AST said it will time product deliveries to coincide with IBM's announced delivery schedule for similar products. AST also outlined the following plans:

- It will migrate a "good chunk" of its remote communications products to IBM's LU6.2 protocol using a pass-through approach instead of relying on older protocols.
- It is investigating which local-area network operating system will make the most sense as a transport for OS/2-based products. Options include Microsoft's LAN Manager; a future version of AST's current network software, Novell, Inc.'s Netware; or something of AST's own design. "We'll wait for the dust to settle before making any firm plans," Krieger said.
- With OS/2 as a multitasking platform, it will provide gateways into IBM's office environment, using IBM's Systems Network Architecture Distribution Services or providing access to Professional Office System electronic mail, co-existing with current AST gateways.
- It will support an SQL data base server, possibly Ashton-Tate Corp.'s, and considers the LAN Manager a "key potential standard."

Users opting for OS/2 Extended Edition will be forced to shell out $800 per user, Krieger claimed, even if they only need one piece of the Communications Manager puzzle. In contrast, AST will price Communications Manager functionality like its current gateways: a one-per-gateway charge for all LAN users, Krieger said. "We will continue, more than likely, to price OS/2 versions in that manner."

Apple suit

FROM PAGE 1

sentation Manager for six months or a year at the very least," said John Rossi, an analyst with Alex Brown & Sons, Inc.

A 1985 visual copyright licensing agreement between Microsoft and Apple for the interface was limited, an Apple spokeswoman said. With Windows 2.03, "we feel that Microsoft has gone beyond the license and is infringing on our audiovisual computer display," the spokeswoman said, declining to provide specifics.

In the suit, Apple asks for damages of $50,000 per infringement and for the "impoundment and destruction of all computer programs known as New Wave and Windows 2.03 or any version, revision or modification thereof or any derivative work based thereon."

The Apple spokeswoman said the suit will likely go on for quite some time. She declined to speculate on whether there is a possibility for an out-of-court settlement.

Rossi and other analysts said that by blocking Microsoft's entry into the ease-of-use arena, Apple could preserve its position as the only company able to offer the friendly interface for the business and education markets, at least temporarily.

According to the suit, HP once sought a license from Apple for Macintosh's audiovisual works, but Apple declined to grant the license.

"Nonetheless, Hewlett-Packard has developed a computer program called New Wave that embodies and generates a copy of the Macintosh audiovisual works," the suit reads.

New Wave reportedly requires Windows 2.03 to operate.

Analysts also questioned how much strain the lawsuit might put on the Microsoft development efforts for the Macintosh. Microsoft is reportedly the leading developer of software for the Macintosh.

"There is a certain amount of risk in what Apple is doing in the possibility of alienating Microsoft and other independent software vendors working to support the Macintosh platform," said Philip Barton, an analyst at Fidelity Investments in Boston.

According to Delbert Yocam, Apple's chief operating officer, Apple has no plans to initiate litigation against third-party application developers.

Sources close to Microsoft Chairman Bill Gates said Gates feels he made a significant contribution to the development of the Macintosh interface through features he incorporated in Microsoft's applications and other software products.

Microsoft and IBM declined comment on the suit. In addition, HP spokesman declined to comment on specifics of the suit but said HP does not believe it has violated any Apple copyrights or patents in the development of New Wave.

West Coast correspondent Stephen Jones and Senior Editor Ed Scannell contributed to this report.

Legal risk fails to scare firms

A pending "look and feel" lawsuit pitting Apple Computer, Inc. against Microsoft Corp. and Hewlett-Packard Co. will have little impact on large corporate users and developers, according to an informal *Computerworld* poll.

In a similar suit last year, Lotus Development Corp. sued Mosaic Software, Inc. and Paperback Software International, claiming the companies' financial spreadsheet products too closely resembled Lotus's popular 1-2-3. The Lotus suit had a negative impact on competitive products.

Robert Coyle, senior vice-president of operations at Sears Roebuck Acceptance Corp. in Wilmington, Del., echoed the sentiments of several MIS managers when he said "I would think that if we had a need for existing software, we would go ahead and buy it."

To Charlie McLoughlin, manager of software support for Touche Ross & Co., the situation is irritating but will not stop him from writing in-house applications for Microsoft's Windows or the Presentation Manager.

"There are windows all over the place," McLoughlin said. "Every workstation has a windows kind of approach. How can you copyright that?"

ALAN J. RYAN

IBM's Unix version to be Posix compatible

BY CHARLES BABCOCK
CW STAFF

NEW YORK — IBM is turning to Unix to create a software architecture that will offer a multiplatform, public domain alternative to its own Systems Application Architecture (SAA).

IBM will start by making a version of its workstation Unix, known as Advanced Interactive Executive or AIX, available a year from now to run on a mainframe as a guest under VM, according to officials at IBM's Madison Avenue offices here last week.

While AIX/370 will manage its own resources, such as I/O, paging and scheduling, it will also give an AIX/370 user access to standard VM facilities. Since AIX is already on the IBM RT Personal Computer workstation and slated to be on the Personal System/2 Model 80, a desktop Unix user could gain access to the Professional Office System under VM/CMS or the SQL/DS relational data base management system, pointed out Thomas K. Dow, AIX product manager in the IBM Data Systems Group in Kingston, N.Y.

'Very serious'

"It's the same two million lines of code across all three hardware platforms," said Judith S. Hurwitz, editor of "Unix in the Office," a publication of Patricia Seybold's Office Computing Group in Boston. "IBM is very serious about Unix this time around," Hurwitz added.

AIX/370 will be compatible with AT&T's Unix System V, Release 2, with job control provided by the University of California at Berkeley's Unix 4.3 rather than System V. AIX/370 will also conform to Posix, the standard under development by the Institute of Electrical and Electronics Engineers, Inc.

Offering a version of Unix that meets industry standards allows IBM to give its customers who are purchasers of Sun Microsystems, Inc. workstations or other Unix-based hardware a way to develop applications capable of running in a multivendor environment, Dow noted. That application portability is one of the goals of IBM's SAA, announced a year ago, for IBM's own varied hardware platforms.

R. Joseph Stockhus, software marketing manager for Amdahl Corp., said IBM was probably experiencing customer demand for Unix on mainframes. Amdahl has offered its version of Unix, UTS, on its plug-compatible mainframes for five years and sold 200 licenses, he said.

The announcement of AIX/370 immediately eclipsed IX/370, IBM's existing version of Unix available for mainframes. IX/370 represented an acquired product, while AIX/370 was developed internally to optimize its operation under VM.

AIX/370 includes the following features:

- Support for 3090 processor Vector Facility for numerically intensive computing in scientific and technical computers under Unix.
- AIX Family Definition, or a consistent set of screen formats, commands, menus and application interfaces across the AIX product line, scheduled to be published in July.
- Network File System (NFS), a separately licensed program that provides support for NFS 3.2 protocols developed by Sun that enables an AIX/370 system to work with other Unix systems attached via Ethernet or the IBM Token-Ring LAN.
- Transparent Computing Facility (TCF), which allows the transparent distribution of data and processes among 31 nodes on an IBM Token-Ring or Ethernet LAN, or Channel-to-Channel Adapter tying together CPUs.

AIX/370 will be sold at a one-time charge of $27,000 for Group 10 processors and $144,000 for Group 40 processors. AIX/370 NFS will be sold for $2,400 to $9,600.

8100 lifeline

FROM PAGE 1

any easy path for migration," McGeough said. "Now, we'll have to decide whether our special applications will outgrow the 9370s over time. Because of the demands on our 8100s, those applications would have to be moved to a dedicated 9370."

Other IBM 8100 users questioned last week said that they had not yet received the customer letter. But some users said that Anthony Mondello, an IBM Application Systems Division vice-president, through personal visits and a videotape presentation, has played an important role in convincing IBM 8100 users to wait for the IBM conversion aid.

Too late for some

Last week's announcement came exactly two years after IBM executives promised Guide International Corp. users that a conversion aid would provide a migration path to the IBM 9370 by 1988. But in that time, many 8100 users have moved to other non-IBM machines, particularly to Digital Equipment Corp.'s VAX machines [CW, March 14].

Dallas consultants B. R. Blackmarr and Associates, which conducted a survey of 8100 users last year, concluded that more than 60% of 8100 users are open to converting to new architectures. "We are seeing a phased replacement of 8100s," said Brian Blackmarr, president of the consulting firm.

"A lot of people have been depreciating their machines, or waiting until they come off lease before they decide whether to get rid of them."

But Blackmarr expects many IBM shops to stay with DPPX as long as they can, particularly among Fortune 500 users who have 8100s controlling warehouse operations and factory terminals. "IBM's conversion aid can be seen as a way to smooth the feathers of the hard-core users," Blackmarr said.

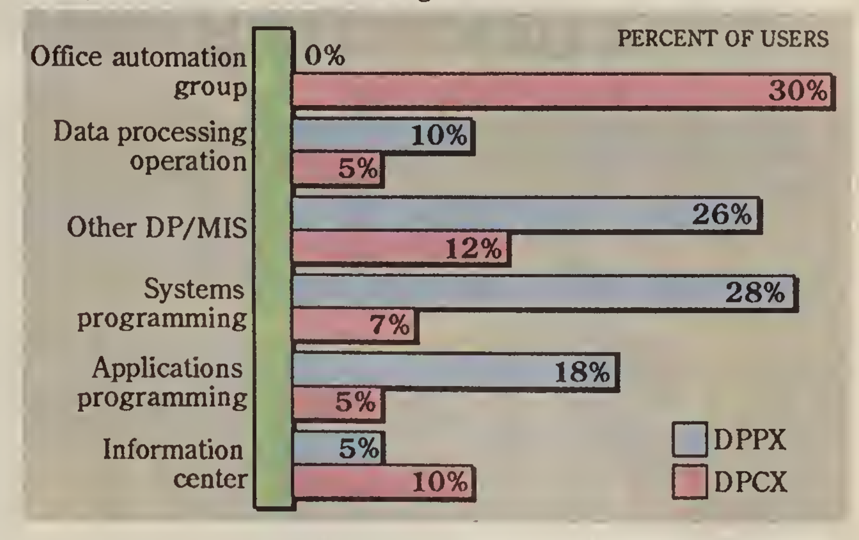
The DPPX conversion works this way: A user pays a one-time charge of $35,580 to $62,270, depending on machine size, to buy the DPPX/370. The one-time fee also allows the user site to run a VS Cobol II compiler on an IBM MVS host to develop DPPX/370 applications and to carry out the DPPX migration.

DPPX/370 will not support the IBM 8100's "loop" local-area networking scheme, IBM said. Instead, DPPX/370 substitutes a direct-connect cable to link the attached devices in a factory-floor setting. It will, however, support IBM's Token-Ring protocol for office applications. DPPX/370 also supports IBM's Systems Network Architecture and the X.25 communications protocol.

Additional fees must be paid for the Cobol facility, which costs $10,800 or $18,900, depending on the size of the 9370 machine, and for a monthly license DPPX/370 charge of $2,900. IBM's Cross System Product Application environment will cost $2,400 or $4,200, depending on machine size, IBM said.

Playing to strength

IBM 8100 users running the DPPX operating system, targeted by IBM's 9370 migration strategy, are more heavily concentrated in MIS functions than those running DPCX



INFORMATION PROVIDED BY B. R. BLACKMARR AND ASSOCIATES
CW CHART

Netview functions expanded

NEW YORK — IBM last week announced centralized Netview control of IBM local-area networks under VM. Also introduced was remote access linking Personal Computer and Personal System/2 users to IBM Token-Ring or PC Networks via telecommunications lines.

Together with IBM's previously announced Intersystem Control Facility/Personal Computer Program (ICF/PCP), the ICF Feature for VM extends Netview system operations support to control and monitor multiple networks from a centralized point under VM.

The host program can support multiple ICF/PC stations and their attached systems. PC communication is accomplished via Advanced Communication Function/VTAM channel support or IBM 3174- or 3274-type controllers.

The IBM Remote Netbios Access Facility Program Version 2.0 rectifies a drawback of Netbios, which only defines what is locally attached. Version 2.0 supports remote telephone asynchronous access to print and file servers on IBM local-area networks.

Remote access is provided via the Rolm Corp. Rolmphone 244PC on the CBX II Models 8000 and 9000, the IBM 9750 Business Communications System, private-branch exchanges and ordinary telephone lines.

The remote access software has a one-time charge of $245 and is slated for delivery in August. Available March 25, the Netview application software has a basic license fee of $7,000. A DSLO license costs $5,250.

IBM 10 series gets yanked

RYE BROOK, N.Y. — With the shipment of the third generation of its 4381 superminicomputers, IBM last week withdrew most of the second-generation 4381s from marketing.

The machines to be taken off the market June 15 are the 4381 Model Groups 12, 13 and 14. The firm has begun shipments of the "20" series during the past three months.

An IBM spokeswoman said the 10 series was withdrawn because the 20 series is now available. The low-end 4381 Model Group 11 remains available as an entry-level system, she said.

With the withdrawal, IBM will no longer sell new 4381 Model Groups 12, 13 and 14 or upgrades within that line. IBM said users with installed systems will see no changes in their support and that upgrades to the 20 series are available.

In a similar announcement, IBM said it will also stop marketing model and memory upgrades for the 4381's predecessor systems, the 4341 series, June 15.

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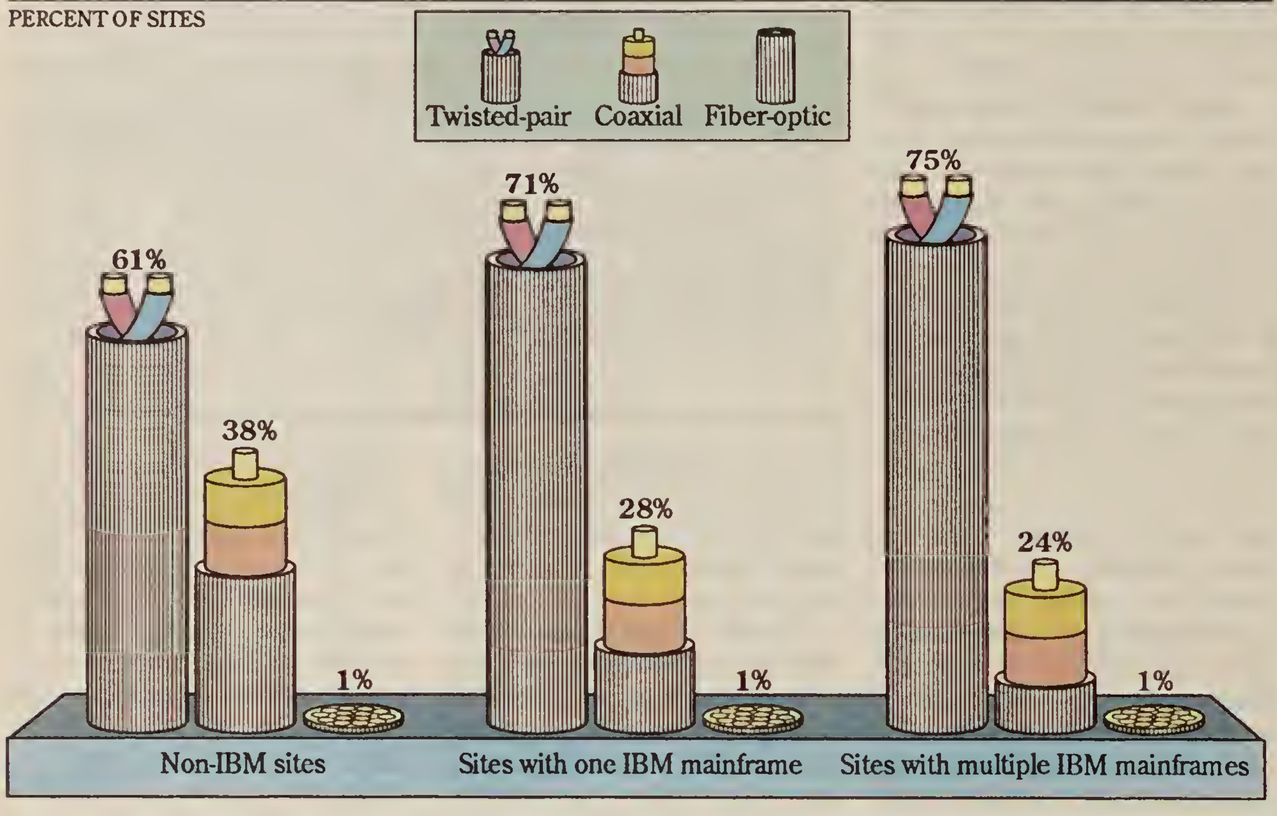
TRENDS

Token-ring networks

Users take twisted approach to token-ring

PERCENT OF SITES



Despite IBM's puzzling two-year inability to ship its Token-Ring boards in volume, industry analysts say token-ring sales are rapidly rising.

Fueling that contention are IBM claims that almost 90% of its top 250 installations have standardized on the Token-Ring. IBM recently executed a settlement with the holder of the token-ring patent to allow use of its adapter cards in non-IBM personal computers. And last month, IBM said it expects to resolve volume distribution problems by the end of the second quarter.

Interest in token-ring technology is evident across the board, according to a recent survey of 3,500 IBM and plug-compatible mainframe sites by Computer Intelligence in La Jolla, Calif. A breakdown of IBM Token-Ring sites by industry revealed that the finance, insurance, medical and education segments have some of the biggest installed bases. Surprisingly, business services recorded the lowest use.

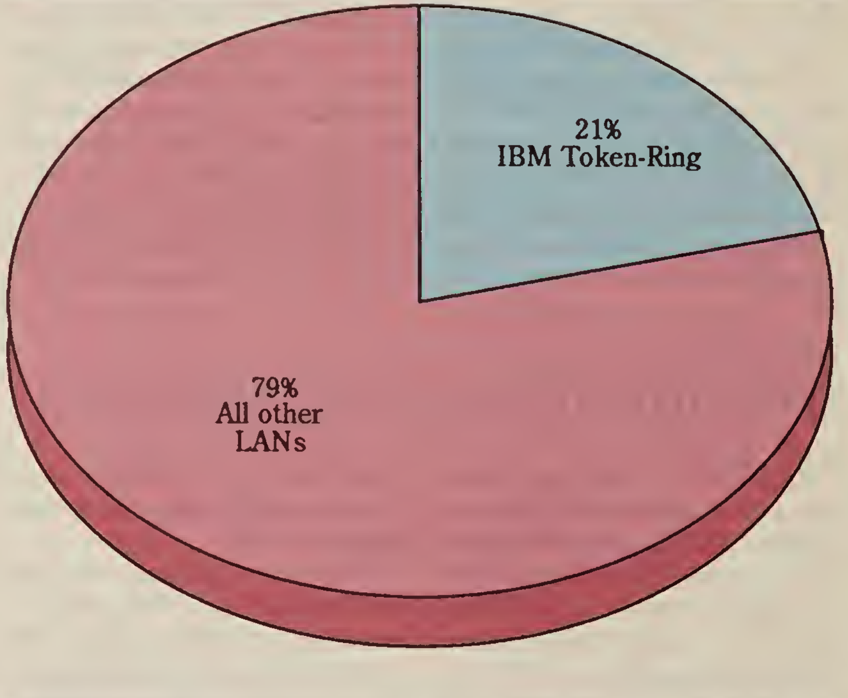
Of sites with installed networks, 21% said they had IBM Token-Ring networks. And 26% of sites planning to install networks during the next 12 months said they would purchase IBM Token-Rings. Another 28% cited a mix of other networks, while a whopping 46% said they were undecided.

The majority of token-ring sites responding to the survey said they use twisted-pair cabling, followed by coaxial cable.

PATRICIA KEEFE

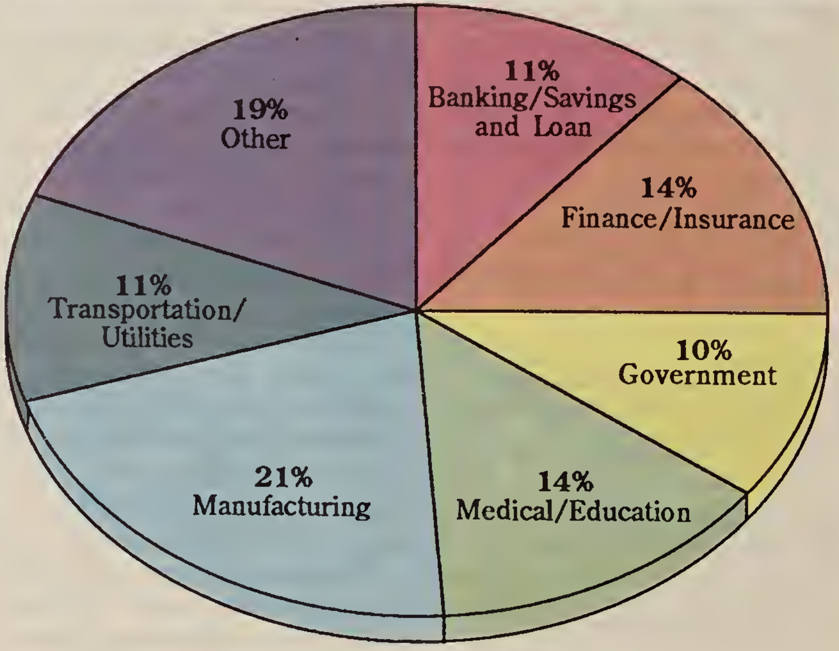
LANs at IBM mainframe sites

PERCENT OF SITES



Business use of IBM's Token-Ring

PERCENT OF SITES



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHARTS: FRANK C. O'CONNELL

INSIDE LINES

Uncle cries "Uncle!" The FCC is dropping its highly controversial plan to make value-added network users pay higher access charges, congressional and industry sources say. The proposal to boost connect charges by about $4.50 per hour generated 2,000 angry letters to the FCC as well as strong opposition in Congress [CW, Oct. 12, 1987].

Vapor falls to earth. After 18 months in the hype-o-sphere, International Microcomputer Software has begun shipping Pageperfect, a $495 package that combines word processing, desktop publishing and graphics. Wonder how long it will take to bring out an update?

Finally, the bottom line. Business users who have been uneasily wondering how much they'll have to pay for ISDN services will get their first solid information March 29, when Illinois Bell becomes the first U.S. carrier to file a regular ISDN tariff with the FCC. Two weeks later, Southern Bell will initiate its commercial ISDN service offering, a special tariff for five customers, including AT&T Network Systems, Prime Computer and Trust Company Bank.

Let's get small. In the next several weeks, Wang is expected to announce replacement systems for the VS 5E, 6E and 75E systems introduced last fall. The new VS 5400 and 5600 models, scheduled for July 1 availability, will have full implementation of Wang's VS 7000 architecture, filling in the lower end of the VS 7000 series. Wang senior vice-president of marketing Bob Ano had hinted at such CMOS-based systems when the 5E, 6E and 75E were announced last October.

A 386 machine is old hat. The very thought of an Intel 80486 chip is enough to send anyone screaming in terror. At the HP New Wave Developer's Conference last week in San Jose, Calif., Microsoft's Russell Warner reassured the audience that OS/2 is the operating system "for the next 10 years" and will support a 486 microprocessor without a great deal of recoding. He also predicted on the near horizon mass-market PCs costing $500, an 80386-based machine priced at less than $1,000 and OS/2 Version 1.1, with the Presentation Manager fully integrated.

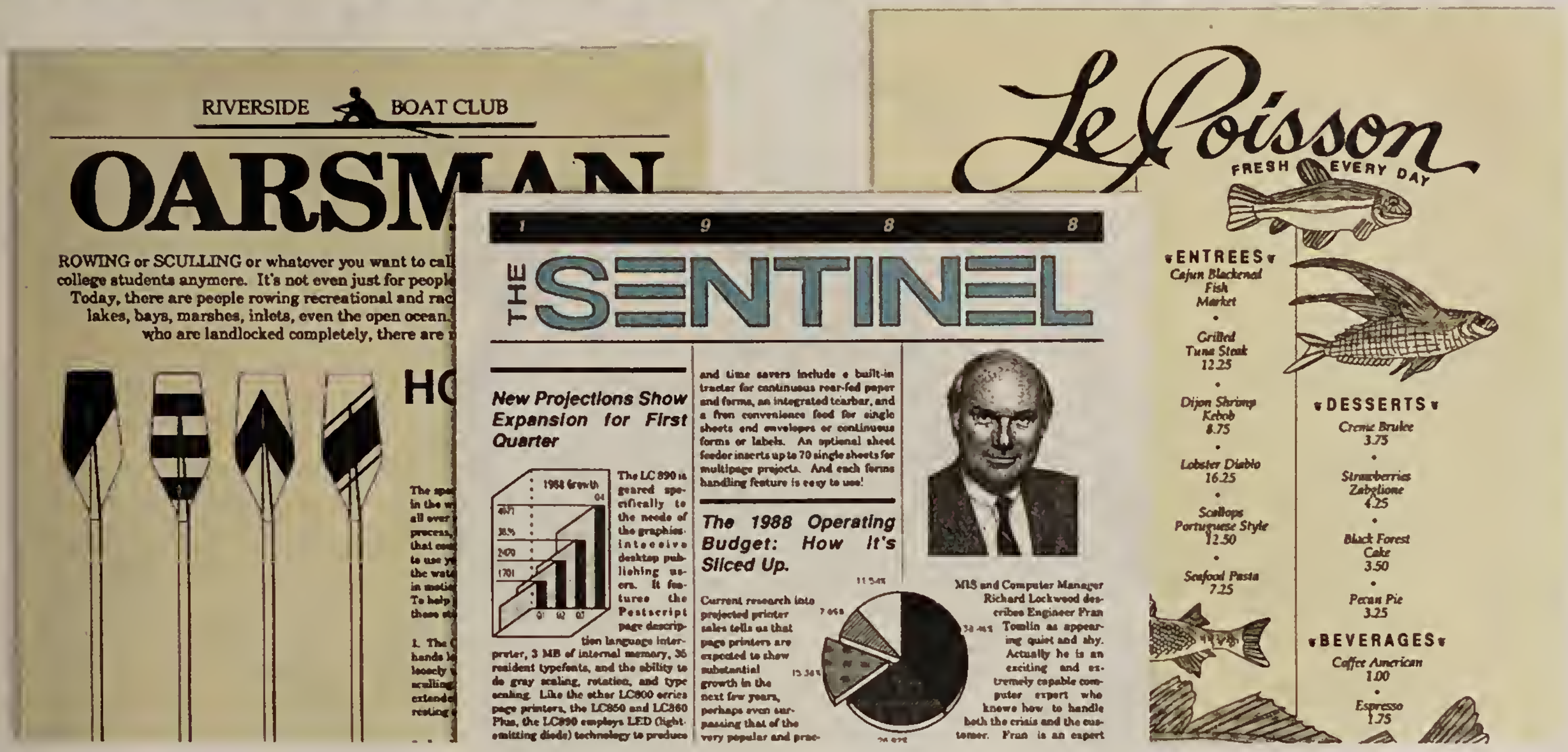
Bad karma. After less than a year as senior vice-president in charge of the analytic software group, Charles J. Digate has left Lotus. Digate, who was responsible for the firm's spreadsheet, data base and mainframe software efforts, resigned last week out of a desire to try something different and because of "a difference in operating philosophies with Jim Manzi," he said. Digate declined to describe what those differences were.

Higher aspirations. For years, cigar-chomping Rep. Jack Brooks (D-Texas) has used his position as chairman of the House Committee on Government Operations to exert extraordinary influence over Uncle Sam's computer and communications systems. But it appears he'll be leaving that post next year for the chairmanship of the House Judiciary Committee now that Rep. Peter Rodino (D-N.J.) is retiring.

Texas two-step. Less than a year after signing on, Dell Computer's senior vice-president of sales and marketing, Graham Beachum, has resigned "for personal reasons," according to Dell officials. Beachum, formerly vice-president of Tandy's Radio Shack Business Products Division, came to Dell last July, bringing a number of Tandy employees with him. A Dell spokesman said Beachum will not be replaced. His duties will be divided between Dell Chairman and Chief Executive Officer Michael Dell, President Lee Walker and Marketing Vice-President Mark Yamagata. Beachum could not be reached for comment.

Suits, countersuits and, especially, Blue suits; we'll listen to them all if there's a hint of a scoop or a titillating scandal. Call the Computerworld *hot line at 1-800-343-6474 (unless you're calling inside Massachusetts, in which case you'll have to call 617-879-0700, at least until June when they zap us with a new area code and we'll have to go through this whole thing again — but that's technology for you!) and ask for News Editor Pete Bartolik.*

OUR SILENTWRITER IS CREATING HEADLINES ON SEVERAL FRONTS.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OARSM

ROWING or SCULLING or whatever you want to cal
college students anymore. It's not even just for peopl
Today, there are people rowing recreational and rac
lakes, bays, marshes, inlets, even the open ocean.
who are landlocked completely, there are

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THE SENTINEL

New Projections Show Expansion for First Quarter

The LC 890 is geared specifically to the needs of the graphics-intensive desktop publishing users. It features the Postscript page description language interpreter, 3 MB of internal memory, 35 resident typefonts, and the ability to do gray scaling, rotation, and type scaling. Like the other LC800 series page printers, the LC850 and LC860 Plus, the LC890 employs LED (light-emitting diode) technology to produce

and time savers include a built-in tractor for continuous rear-fed paper and forms, an integrated tearbar, and a front convenience feed for single sheets and envelopes or continuous forms or labels. An optional sheet feeder inserts up to 70 single sheets for multipage projects. And each forms handling feature is easy to use!

The 1988 Operating Budget: How It's Sliced Up.

Current research into projected printer sales tells us that page printers are expected to show substantial growth in the next few years, perhaps even surpassing that of the very popular and prac-

MIS and Computer Manager Richard Lockwood describes Engineer Fran Tomlin as appearing quiet and shy. Actually he is an exciting and extremely capable computer expert who knows how to handle both the crisis and the customer. Fran is an expert

Le Poisson

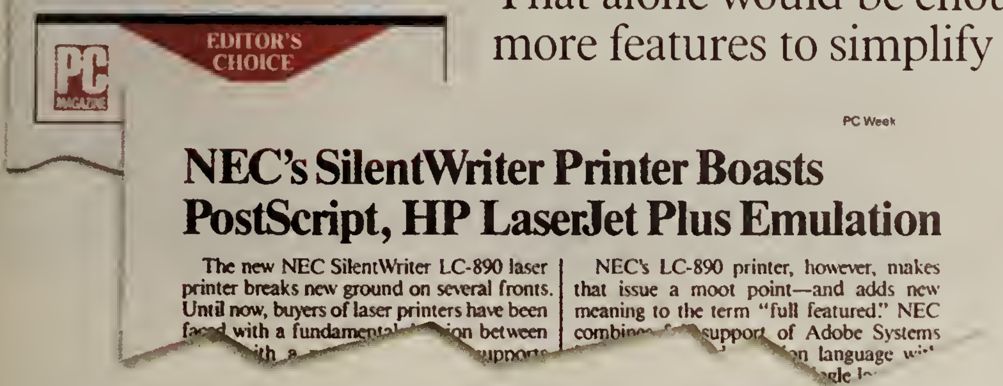
FRESH EVERY DAY

ENTREES
Cajun Blackened Fish
Market
Grilled Tuna Steak
12.25
Dijon Shrimp Kebob
8.75
Lobster Diablo
16.25
Scallops Portuguese Style
12.50
Seafood Pasta
7.25

DESSERTS
Creme Brulee
3.75
Strawberries Zabglione
4.25
Black Forest Cake
3.50
Pecan Pie
3.25

BEVERAGES
Coffee American
1.00
Espresso
1.75

Our Silentwriter™ LC890 is the first desktop publishing printer that gives you both popular standards for creating graphics and type: true Adobe PostScript® and LaserJet Plus emulation.


PC MAGAZINE EDITOR'S CHOICE

PC Week

NEC's SilentWriter Printer Boasts PostScript, HP LaserJet Plus Emulation

The new NEC SilentWriter LC-890 laser printer breaks new ground on several fronts. Until now, buyers of laser printers have been faced with a fundamental [illegible] between

NEC's LC-890 printer, however, makes that issue a moot point—and adds new meaning to the term "full featured." NEC combin[illegible] support of Adobe Systems [illegible] language

That alone would be enough to cause headlines. But we also added many more features to simplify desktop publishing. Like both Apple and IBM compatibility. *PC Week* stated, "the LC890 is actually better than having both an Apple LaserWriter Plus and an HP LaserJet Plus on your desk." Equally impressed, *PC Magazine* awarded it an "Editor's Choice." And cited it in their "Best of 1987" issue.

And because the Silentwriter has a simple, trouble-free printing mechanism, it will be creating headlines for years to come. In fact, it's twice as reliable as ordinary lasers, with an average life of 600,000 pages.

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John Zakibe, Accounting Systems Manager, adds, "MSA products are excellent, and so are their people. All my contacts with them have been good experiences. And I wouldn't hesitate to recommend MSA to any other city government."

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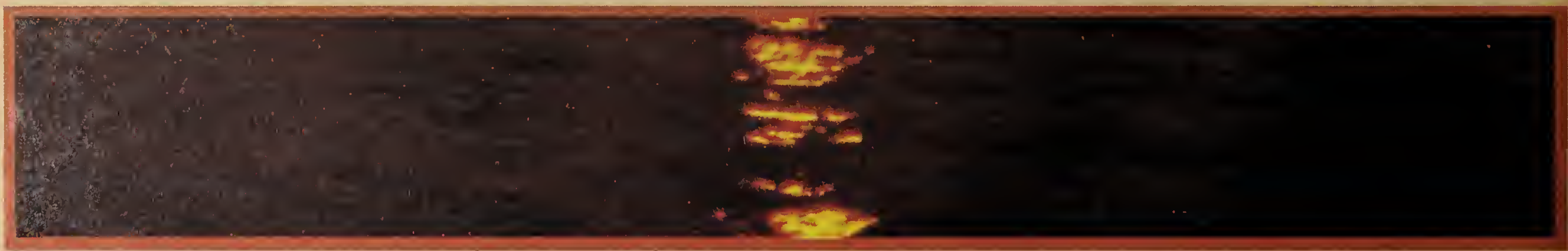

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